Bob Richards' Candid Camera Gets Some Wolverines

Bob Richards of Westinghouse recently made a trip through Michigan with his candid camera, and he brought back this photographic evidence. (1) George Walz, Jr., of Saginaw, one of Westinghouse's outstanding Michigan dealers, studies a copy of Electric Refrigeration News; (2) model kitchen of Muskegon Heights Lumber Co.; (3) Ray Badgero, star salesman for Walz Hardware Co.; (4) J. H. Campbell, district manager; W. L. Howlett, sales promotion manager; R. J. Schneider, retail sales manager; and P. E. Rinehart, merchandise manager, at Detroit's Wesco branch; (5) Cliffe Keen, University of Michigan's wrestling coach, and his daughter, Joyce, get some Westinghouse-refrigerated milk from their refrigerator.

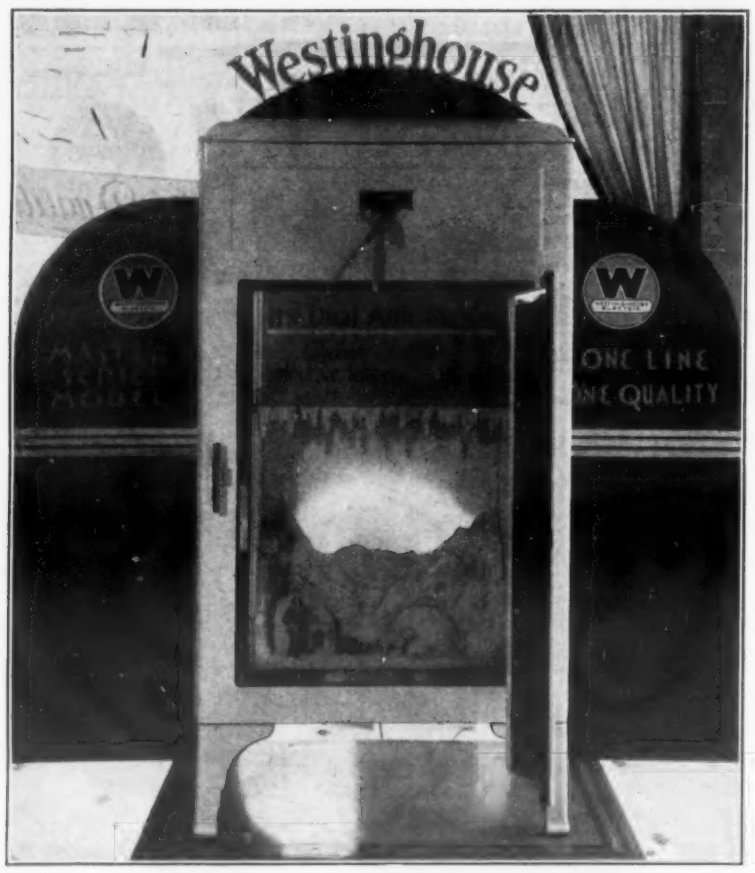
Miniature Camera Portraits of Important A.S.R.E. Members

A popular delegate to A.S.R.E. conventions is Harry Williams, Frigidaire research engineer.

A past president of the society, Glenn Muffly is still an active consultant on all society affairs.

A. W. Oakley of New York City ably guided the society as its president during the past year.

Active in management of A.S.R.E. conventions is Helen Peffer.



Interesting Interior

A display within a refrigerator was conceived by J. E. Hugo, sales promotion manager of the central district of Westinghouse Electric & Mfg. Co. By removing the shelves and evaporators, a complete display is put inside. Flashing Neon tubes give the effect of an Aurora Borealis.

Seeing Seth

Streams of people, similar to the ones shown at left, visited the Seth Parker as it was anchored at the historic T wharf in Boston for three days. Weekly broadcasts from the ship are sponsored by Frigidaire Corp.

Around the Country with Kroger-Westinghouse School

Westinghouse kitchen appliances are being used in the Kroger Food Foundation Cooking Schools. (1) Specially equipped 24-foot equipment truck and the troope travelling with the school; (2) A few of the usherettes at the Peoria school; (3) Women in the foyer of the Kansas City convention hall awaiting the opening of the first day's session which attracted 5,000.

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

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MAJESTIC GETS COURT SUPPORT IN ZENITH TIFF

Grigsby-Grunow Heads Learn Receivership Has Its Points

By George F. Taubeneck

CHICAGO—Being in a state of receivership can have some unexpected advantages, officials of the Grigsby-Grunow Co. learned last week, much to their joy. It can halter competition and make it "play fair." Here's how:

Zenith Radio Corp., Majestic officials alleged, sent out a general letter to dealers and distributors, stating that Grigsby-Grunow was bankrupt and otherwise attempting to take advantage of the situation.

Immediately Federal Judge John P. Barnes moved that Zenith executives be held in contempt of court for remarks which were construed as an attempt to "raid" the Majestic dealer list.

Almost as quickly, Zenith publicly retracted, and sent another letter to dealers, which stated: "any statements which you may have construed as instructing you to endeavor to persuade Grigsby-Grunow dealers to sever their connections with that company are hereby rescinded.

"Any statement made in that bulletin indicating, or which you may have construed as implying, that Grigsby-Grunow is bankrupt is likewise rescinded and we regret if our letter did create that impression. Grigsby-Grunow is being operated under equity receivership. The orders entered by the United States District Court specifically authorize and direct the receivers to continue to operate the business."

At the same time the Grigsby-Grunow Co. sent out two letters to dealers, in one discussing prospects for business, and in the other discussing the Zenith letters. Regarding the latter, Grigsby-Grunow officials wrote:

"This material should not be used against Zenith business, and there should be no advertising respecting it."

Bankruptcy Petition Dismissed

CHICAGO—A motion for the adjudication of the Grigsby-Grunow Co. of this city as bankrupt was denied Dec. 23 by Federal Judge John P. Barnes.

The company is operating under an equity receivership with Attorney Thomas Marshall and LeRoi J. Williams, vice president and general manager, as receivers.

1934 GRUNOW TO GO INTO PRODUCTION IN JANUARY

CHICAGO—Production on the 1934 line of Grunow refrigerators will start the first week in January with a schedule of 250 units a day, to be increased to an output of 1,500 a day, according to William C. Grunow, president of General Household Utilities Co. here.

Several hundred workers will be reemployed by General Household in January when installation of new machinery and expansion of factory facilities are completed. The number will be gradually increased until a force of approximately 3,500 workers is employed, Mr. Grunow says.

The company has increased its refrigerator production space to 350,000 sq. ft. and spent $500,000 for machinery and expansion work.

General Household's 1934 schedule will be approximately 100 per cent greater than in 1933, according to Mr. Grunow.

Slide Film Closes Sale To Deaf Prospects

SIOUX FALLS, S. D.—President Claus of the Electric Construction Co., local Westinghouse dealer, wasn't making much progress by exchanging notes with two deaf and dumb prospects, so he brought out his slide film projector and ran off several Westinghouse films. Result: sale of an AL-75 Westinghouse refrigerator.

Air-Conditioning Survey in 12 Cities Shows Popularity of Small Units

* * *

By John T. Schaefer

CHICAGO—That substantial progress was made in air conditioning this past season was demonstrated by E. W. Lloyd, vice president of the Commonwealth Edison Co. of Chicago in a report which Mr. Lloyd presented recently to the Association of Edison Illuminat'ng Companies in a meeting at White Sulphur Springs, W. Va.

Mr. Lloyd's paper included data on air-conditioning installations connected to the power lines of 12 large utility companies which had cooperated with him in furnishing facts for his survey.

The reporting companies were Commonwealth Edison Co. (Chicago), Cleveland Electric Illuminating Co., Detroit Edison Co., Milwaukee Electric Railway & Light Co., New York Edison Co., Pacific Gas & Electric Co. (San Francisco), Philadelphia Electric Co., Public Service Co. of Northern Illinois (Northern Illinois exclusive of Chicago), Southern California Edison Co. (Los Angeles), Union Electric Light & Power Co. (St. Louis), Union Gas & Electric Co. (Cincinnati), and the Consolidated Gas, Electric Light & Power Co. of Baltimore.

Information presented included refrigeration tonnage, connected horsepower of air-conditioning installations, number of installations made both prior to 1933 and during the past season, educational programs conducted by the various utilities, and descriptions of some of the most interesting installations.

Table 1 shows a summary of the data presented by the 12 companies on number of installations made (1) before 1933, (2) during the first eight months of 1933, and (3) total number in operation. Table 2 gives the connected horsepower of air-conditioning equipment on power lines of the various companies.

It will be noted that some companies gave information only on installations made up to the first of this year, others reported installations put in this year, and still others reported only the total of installations made through August of this year, hence the data are not sufficiently uniform to draw significant totals for all cities.

Also the difficulty of collecting such information makes it probable that some installations, particularly of the small unit type, have been overlooked. Figures for New York City, for instance, were reported with the explanation that the survey is now somewhat incomplete, and is being brought up to date as fast as possible by the New York Edison Co.

Each one of the utility companies prepared a report on the present status of air conditioning in its terri-

(Continued on Page 8, Column 1)

TABLE 1—Number of Installations

Location	Before 1933	First 8 Months of 1933	Total Now In Operation
Chicago	176	120	296
Cleveland	...	...	40
Detroit	...	33	108
Milwaukee	18	13	31
New York	220	309	529
San Francisco	212	...	...
Philadelphia	161	20	181
Northern Illinois	23	25	48
Los Angeles	7	11	18
St. Louis	91	64	155
Cincinnati	44	30	74
Baltimore	...	...	66

TABLE 2—Connected Horsepower

Location	Before 1933	First 8 Months of 1933	Total Now In Operation
Chicago	25,376	2,367	27,743
Cleveland	...	...	5,705
Detroit	...	263	*7,862
Milwaukee	3,090	277	3,367
New York	13,645	5,655	19,300
San Francisco	3,324	...	...
Philadelphia	13,796	338	14,134
Northern Illinois	2,938	449½	3,387½
Los Angeles	660	727	1,387
St. Louis	6,565	773	7,337
Cincinnati	3,681	482½	4,163½
Baltimore	...	...	3,682

*This figure represents tons of refrigeration, not horsepower.

10 AIR CONDITIONERS IN NEW SERVEL LINE

EVANSVILLE, Ind.—Supplementing and replacing Servel air-conditioning equipment manufactured during the past two years, 10 new units have been introduced to its commercial distributors by Servel, Inc., here.

Largest model of the new line is a conditioner with an ice-melting capacity ranging between 250 and 350 lbs. per hour. This model is designed for cooling and dehumidifying in the summer, heating and humidifying in the winter, and filtering and circulating the air at all times.

Other models include a redesigned Humidraft unit for air-conditioning work; a floor-type room cooler of conventional design which is applicable for heating and humidification in winter; and a self-contained summer air conditioner.

Servel is manufacturing a five-ton and a seven-ton compressor for use with its air-conditioning equipment, according to W. Paul Jones, advertising and sales promotion manager of the company.

Joins Potter

* * *

TAYLOR WILL DIRECT POTTER'S MARKETING

BUFFALO—A. M. Taylor, formerly merchandising director of Leonard Refrigerator Co. in Detroit, has joined Potter Refrigerator Corp. of this city as marketing director, announces T. Irving Potter, president of the company which bears his name.

Previous to his experience with Leonard, Mr. Taylor was advertising manager of Kelvinator. Before that he was for several years advertising manager of Copeland.

Capitalizing on a Popular Mania

Down in Marion, Ind., the Butler Music Co., a dealer for Hoosier Electric Refrigeration Corp. (G-E distributor in Indianapolis), doped out this timely attention-getting display.

G-E INSTITUTE DEDICATED AS NATION LISTENS

Quinn, Young Officiate In Ceremonies at Nela Park

By George F. Taubeneck

CLEVELAND — While the Three Little Pigs danced gaily in mazda light outside the new General Electric Institute in Nela Park, the friendly voice of Owen D. Young entered the "settin' room" of millions of American homes last Friday night and thus the whole country could take part in the official dedication of the institute.

Introducing Mr. Young to the radio listeners, Vice President T. K. Quinn explained that the General Electric Institute is "a place for the teaching of teachers," and that it was being dedicated to the progress of the intelligent use of electricity in American homes.

Over the big NBC hook-up, Mr. Young, chairman of the board of the General Electric Co., famed international diplomat and financier, and one of America's greatest industrialists and men of public figures, talked in homely fashion and sent a message of homespun philosophy into the homes which General Electric hopes to "emancipate."

Mr. Young employed somewhat the same radio manner which has endeared President Franklin D. Roosevelt to the public—he talked quietly and good-humoredly, and used simple language everybody could understand.

No house, he said, has more than three rooms—the dining room, the bedroom, and the "settin' room." And he indicated that it was the purpose of the General Electric Institute to make these rooms (especially the kitchen) more livable.

The institute itself contains several models of those three indispensable rooms, each a marvel of efficiency and convenience and beauty.

The lighting effects—particularly in the dining room, which changes colors and tones like one of those "color organs" oh'd and ah'd at by A Century of Progress visitors—were fully as remarkable as might be expected to result when all the lighting experts around Nela Park were turned loose on the job.

Outside the institute and all over Nela Park these same engineers had ranged a fairyland of fancifully decorated Christmas trees (one of them floating in a pool), an electrical Santy Claus and reindeer, and, most popular of all, the Three Little Pigs. Over

(Concluded on Page 5, Column 1)

12,000 REFRIGERATORS SOLD IN BUFFALO AREA

BUFFALO—Sale of 12,000 electric refrigerators in the Buffalo district during the first 10 months of 1933 has been reported by the Electrical League of the Niagara Frontier as a result of a survey conducted by the league among 20 refrigeration sales outlets here.

To insure accuracy of the figures, the survey was conducted by means of a ballot box in which each firm deposited its sales statistics with no identification as to company.

Monthly figures from which the total was obtained, as reported to distributors in the area, are as follows:

January	189
February	274
March	594
April	1,330
May	2,119
June	2,363
July	1,533
August	1,279
September	685
October	338
Total	11,797

The additional 1,093 sales making up the total of 12,000 were reported by a company which did not submit its sales by months, but only as a 10-months figure. Reports of two concerns are missing, and Mr. Vineberg estimates they would probably account for 6 per cent of the total business.

The league plans to develop similar ballots in the future every second month, making possible a survey of monthly results throughout the year.

BY GEORGE F. TAUBENECK - - -

Biggest News of 1933

Biggest news of 1933, so far as ELECTRIC REFRIGERATION NEWS was concerned, was the fact that for the first time in the history of the industry, the million mark in electric refrigerator sales was passed this year—and after only 10 months, at that.

Upsetting all the dope, during a year few people expected to be a winner, around 1,013,200 household refrigerators (Electric Refrigeration Bureau estimates 1,010,245) had been sold by 40 manufacturers by the end of October.

The first quarter was discouraging.

Never have distributors been so blue or manufacturers so apparently hopeless as they were in January and February of this year. Business was rotten. It not only wasn't getting any better, but it seemed to be headed down a toboggan slide. And then, climax of all lugubrious climaxes, all the banks in the country closed.

Some of the biggest factories in the industry were completely shut down. Others were running only part time. And then it came. When it rained, it poured — orders. Quickly running through the piled up field stocks, cleaning out the nation's warehouses before manufacturers' field men could come out of the state of coma into which lack of business had drugged them, dealers began demanding more refrigerators. Workmen were hastily called back, production lines whipped into shape again, and the wheels started turning.

Here again came a difficulty caused by the fact that nobody had foreseen and been able to predict the sudden rush of business. No parts or materials were to be had. Factories would receive a shipment of parts, work madly for a few hours, and then shut down again pending the arrival of another trainload or carload of supplies. Production managers went through the worst hell of their entire experience as factory managers.

Almost any distributor or dealer one talks to will tell you he could have sold lots more refrigerators than he did during the late spring and early summer of 1933—if he had had them to sell. People were in a buying mood, and not being able to get an electric refrigerator, bought something else with the currency they removed from underneath the mattress.

In other words, if by some miracle executives had been granted clairvoyant sight—and if, by another miracle, they would have been able to believe what they saw in the magic crystal ball—and had been prepared for the biggest buying rush in the history of electric refrigeration, the sales total for the year might have been higher than even the present eminently satisfactory figure.

Demand held up through June and July, and even ordinarily dull months like August, September, and October produced new records.

New York again led the roster of states in sales, having absorbed almost twice as many refrigerators as its nearest rival, Pennsylvania. New York, Pennsylvania, and New Jersey—containing the practically contiguous New York City-Newark-Philadelphia metropolitan territory—between them accounted for one-third of the nation's total sales.

Illinois, Ohio, and Michigan, which not only harbor mighty metropolitan centers, but which also manufacture the great bulk of the total output of electric refrigerators, ranked third, fourth, and tenth, respectively, among the states when lined up in order of the number of electric refrigerators sold within their confines.

Following are excerpts from stories in ELECTRIC REFRIGERATION NEWS which tell the tale.

CLEVELAND, April 19 — Factory forces in all General Electric refrigerator plants have just been increased from 50 to 100 per cent to meet current sales, while shipments from the production line to the field are now at the rate of one trainload per day, according to P. B. Zimmerman, manager of General Electric's refrigeration department.

DETROIT, April 19—With increases in both commercial machine sales and department store sales of household refrigerators, Universal Cooler Corp. has stepped up production to the point where more workers are now employed in the Universal factory than ever before in the history of the company, according to G. M. Johnston, president.

MANSFIELD, Ohio, May 3—April production schedule of Westinghouse Electric & Mfg. Co. called for manufacture of 4,500 electric refrigerators, according to officials of that company, who report that unfilled orders now total more than 10,000 units.

DETROIT, May 3—Kelvinator Corp., with the shipment of 30,116 units in April, today reported the biggest month in the 19 years of the company's history.

CINCINNATI, May 10 — Crosley Radio Corp. has doubled the number of employes in its refrigeration department and is now producing 500 refrigerators per day, according to G. H. Corbett, advertising manager. Orders for Crosley electric refrigerators are approximately 100 carloads ahead of production.

DETROIT, May 10—With orders for the last six days of April totalling 7,446 units, Norge Corp.'s production was 5,633 units behind orders yesterday, according to Howard E. Blood, president of the company.

GREENVILLE, Mich., May 17—Over 14,000 unfilled orders have piled up at the Gibson Electric Refrigerator Corp. plant here, in spite of the fact that the factory has been working on a 24-hour basis since February, accord to W. R. Marshall, director of advertising and sales promotion.

Telegram to ELECTRIC REFRIGERATION NEWS, June 7— Westinghouse booked more refrigerator orders in May than any other month in our history stop Orders coming in at rate of 850 per day stop Close of business June 5 back orders total 8,740. R. C. Cosgrove, Mansfield.

Telegram to ELECTRIC REFRIGERATION NEWS, June 7—As of June 1 Grunow Corp. is 10,362 units behind in delivery of refrigerators. Duane Wanamaker, Chicago.

What Happened In 1933

To summarize the news which was made by the refrigeration industry in 1933, a resume of the year's events, trends, and movements begins on this page. It will be continued in the next issue.

DETROIT, June 7—Establishing the second successive all-time record for monthly production, Kelvinator Corp. shipped a total of 43,357 units in May, according to H. W. Burritt, vice president in charge of sales.

CHICAGO, June 21—July production schedules for Majestic electric refrigerators will be the largest in three years, according to LeRoi J. Williams, vice president and general manager of Grigsby-Grunow Co.

DETROIT, July 5—Orders received by Kelvinator Corp. in June passed that company's all-time record, H. W. Burritt, vice president in charge of sales, announced on July 1. June orders totalled 44,525.

DETROIT, July 26—June factory sales of household electric refrigerators set a new monthly record of 219,400, bringing the total sales for the first six months of the year to 693,000 which is well above the six-months total for any other year in the industry's history.

DETROIT, Aug. 2—With its plants in Detroit and Muskegon operating at peak capacity at the end of July, Norge Corp.'s sales from July 1 through July 20 were equal to all sales for the last six months of 1932, according to John H. Knapp, vice president in charge of sales.

NEW YORK CITY, Sept. 6—During the first six months of 1933, refrigeration sales accounted for almost 50 per cent of the total business of the Westinghouse Electric & Mfg. Co., said R. C. Cosgrove, Westinghouse refrigeration division manager.

CHICAGO, Sept. 12—"We started out to sell 20,000 refrigerators this year," William C. Grunow told distributors gathered here for convention. "We've sold more than 70,000 already."

DETROIT, Nov. 1—Unit sales of household electric refrigerators to distributors and dealers, as reported by members of the Refrigeration Division of National Electrical Manufacturers Association for September, were 60,840 as compared with 30,513 in September, 1932—an increase of 99.39 per cent, according to report issued by Louis Ruthenburg, consultant to that organization.

• • •

NRA, Nema, et al

Second biggest news of the year was probably the NRA and its effect upon the electric refrigeration industry.

When President Roosevelt signed the National Industrial Recovery bill on June 16, he indirectly brought about four results: the first all-industry conference of electric refrigeration executives, expansion of the National Electrical Manufacturers Association, increases in employment and wages throughout the industry, and a general upward shift in refrigerator prices.

Possible passage of this bill (while it was still before the House) was the chief topic of discussion at all spring meetings of manufacturers.

Nema, convened at Hot Springs, Va., late in May, agreed in spite of internal differences of opinion to accept the plan for government control as inevitable and to proceed promptly to adjust operating methods according to the provisions of the law.

The Refrigerating Machinery Association, Radio Manufacturers Association, American Washing Machine Manufacturing group, American Oil Burner Association, all discussed the bill and its probable effects and laid plans to cooperate with it.

Responding to the need for immediate action, F. M. Cockrell, publisher of ELECTRIC REFRIGERATION NEWS, made a proposal before the Nema meeting in Hot Springs that the officers of that body call a meeting in Detroit as early as practicable after passage of the law, inviting all manufacturers of mechanical refrigerators.

It was suggested that the Nema group give to the other manufacturers at this meeting the benefit of its advanced knowledge and expert legal interpretation of the law acquired by official contact with the government; that the manufacturers not represented in Nema be allowed to inquire into the activity of Nema with a view to determining its qualifications and fitness to represent the industry; and that any executive not in sympathy with the Nema organization as the representative of the industry be free to voice his objections and to propose a counter plan.

A resolution to call such a meeting was unanimously adopted by the National Electrical Manufacturers Association at Hot Springs, May 24.

Passage of the bill came June 16. Official announcement of the prospective all-industry conference was made by Chairman of the Nema Refrigeration Division G. M. Johnston June 28, setting the date as July 6, the time as 2 p. m., and the place as the Maccabees building, Detroit.

Coincident with this meeting, Walter Seeger, vice president of the Seeger Refrigerator Co., called a conference of cabinet manufacturers for 10 a. m., July 6, while Lester Larkin, president of Larkin Refrigerating Corp., presided over a similar meeting of evaporator manufacturers at the same time.

Some 75 manufacturers of electric refrigerators, parts, materials, and supplies conferred on July 6 in Detroit, and adjourned the one-day meeting with a decision to adopt Nema as the representative association through which the refrigeration industry as a whole would operate under the NRA.

Plans were laid whereby non-Nema manufacturers would be allowed to join, and several companies announced their intention of filing application for membership at that time.

During the course of the meeting Louis Ruthenburg, consultant to the Refrigeration Division of Nema, outlined the course which would be taken, if the refrigeration industry decided to unite with Nema, in formulating a code to conform with the provisions of the Recovery Act. The Board of Governors of Nema, according to Mr. Ruthenburg, had appointed a committee of five to work out a code of fair competition broad enough to cover the operations of the entire Nema membership.

After approval of this code, the Refrigeration Division would draw up a supplementary code with provisions that would deal specifically with the operations of its membership.

Most of the questions raised by nonmember manufacturers at the meeting dealt with the matter of autonomy for the Refrigeration Division; objections made on the grounds of the power of the Board of Governors of Nema to veto proposals made by the divisions were set at rest by Mr. Ruthenburg, who pointed out that the veto power was seldom used in matters recommended for acceptance by the divisions.

The parts and accessories group meeting before the main event of the day, adopted a resolution to apply for membership in Nema as part of the Refrigeration Division, and selected Walter Seeger to head their temporary association. Mr. Ruthenburg was intrusted with the matter of laying this proposition before the Nema Board of Governors.

With the wheels beginning to turn toward expansion of the Refrigeration Division of Nema, hearings on the code proposed by the association were scheduled to be held before Deputy Administrator W. L. Allen on July 19.

Presented practically unchanged, to President Roosevelt the last week in July, the Nema code received his approval on Aug. 4 and became effective Aug. 15.

A meeting of refrigeration manufacturers for the purpose of drawing up a supplemental code to regulate trade practices in the electric refrigeration industry was called for Aug. 10 at the Book-Cadillac hotel in Detroit. Invitations were issued to members of the Refrigeration Division and to manufacturers who had applied for membership in the Refrigeration Division.

These latter included the following six concerns: Tricold Refrigerator Corp. (now Potter Refrigerator Corp.), Stewart-Warner Co., Uniflow Mfg. Co., Sunbeam Electric Mfg. Co., Merchant & Evans Co., and Rudolph Wurlitzer, Inc.,—bringing the total membership of the refrigeration division to 17 (Copeland dropped out this year).

Other members are: General Electric Co., Westinghouse Electric & Mfg. Co., Frigidaire Corp., Kelvinator Corp., Norge Corp., Servel, Inc., Universal Cooler Corp., Crosley Radio Corp., Grigsby-Grunow Co., Gibson Electric Refrigerator Corp., Trupar Mfg. Co.

Two meetings were held by this augmented group to discuss the refrigeration code, one on Aug. 10 and the other on Aug. 30. When the second one adjourned, it was believed that a final code, designed to eliminate the evils and abuses which have crept into the electric refrigeration business as a result of keen competition and rapid expansion, had been drawn up.

Purposes of the supplementary code are (1) To provide regulations for fair competition and the protection of honest manufacturers, and for such other necessary matters as may not be included in the basic Nema code, and (2) To facilitate settling members' complaints and disputes under the NRA where it may prove possible, before having recourse to the Nema organization under the basic Nema code.

Most important competitive angles of the code which came in for discussion were advertising and sales promotion, terms, warranties and free service, and refrigerants.

These and other considerations kept the code from final approval of the Refrigeration Division until the annual Nema meeting in Cleveland the last week in September.

In order to become effective, this supplementary code must be submitted for approval to the Board of Governors of Nema and then successively to Deputy Administrator W. L. Allen, General Hugh S. Johnson, and President Roosevelt.

At this time it awaits approval of Nema's Board of Governors.

While the Refrigeration Division was experiencing growing pains and trying to get its code in order, other groups were seeking affiliation with National Electrical Manufacturers Association.

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Suppliers' Code

By the end of August, the Radio Manufacturers Association (which had requested exemption from the Nema code) and the Vacuum Cleaner Manufacturers Association (which had objected to inclusion under the Nema banner) were negotiating with Nema for a membership arrangement which would permit them to come under the provisions of the Nema code and maintain their standing as autonomous bodies.

Meanwhile the manufacturers of accessories, parts and supplies for electric refrigerators had held a second meeting under the leadership of Walter Seeger in Chicago, and passed a resolution calling for the formation of the Association of Electric Refrigeration Accessory Manufacturers to take a course of action in accordance with the provisions of the National Recovery Act, and to prepare to operate under the Nema code.

When Louis Ruthenburg communicated the desire of this group to affiliate with Nema to the Board of Governors of the association, an obstacle was encountered. The board objected to inclusion of the group in Nema on the grounds that the diversity of products represented by this branch of the industry would unduly complicate the problems of the association as a whole.

Mr. Ruthenburg brought the report of the board's attitude to another meeting of the temporary accessory group held at the Book-Cadillac hotel in Detroit Aug. 31.

Result was the disbanding of the temporary parts and accessories association and the affiliation of its member companies with associations other than the household refrigerator group.

One section of the accessory manufacturers, the makers of finned coils and condensers had previously organized (Aug. 8) as the Extended Surface Manufacturers Association, planning to submit a tentative code and by-laws through the accessory group after it became a member of Nema. Upon failure of this plan, these companies planned to file application for membership in the Fabricated Metal Products Association.

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Commercial Code

A code of fair practice for the commercial refrigeration industry—including display cases, wall coolers, restaurant boxes, etc.—was drawn up and submitted to the Recovery Administration in August by the Commercial Refrigerator Manufacturers Association.

Pending announcement of a public hearing on the code, the administration agreed to substitute the hours of labor proposed by the association for those obtaining under the President's Reemployment Agreement.

Public hearings were started Nov. 9 in Washington, and the code went through a three-day session without any major additions or deletions being made to the submitted draft.

Most important provision of the code is probably that which declares that no instalment sale shall be made which provides less than 10 per cent of the net sales price in cash accompanying order, and which provides a total of less than 20 per cent to be paid prior to delivery to the customer.

The balance must be paid within 24 months and no monthly instalment can be less than $15. All down payments are to be based on the net delivered price, after deduction of credit for any trade-in made.

Unfair trade practices include selling below cost and reselling refrigerating units which are products of other industries to commercial customers without addition of a reasonable cost for handling.

Approval of the code by the President is expected momentarily.

Other industries allied to the electric refrigeration industry began submitting codes to Washington during the summer and fall.

The Porcelain Enamel Institute circulated a bulletin among its membership in May outlining a procedure for initiating a program of inter-industry cooperation and self-regulation by firms primarily engaged in the manufacture of porcelain enameled, vitreous-enameled, or glass-coated products. The wage rate proposed by this group was accepted by the NRA Aug. 12.

The Refrigerating Machinery Association first requested and was granted in October a substitution of hours to replace those stipulated by the President's Reemployment, and then set to work drafting a code which formed the main topic of discussion at the association's annual meeting held Oct. 18-20 in York, Pa.

The oil-burner industry submitted a code outlawing the practice of selling or exchanging any product or service at a price level below actual cost, and received the President's approval in early October.

Codes for commercial testing laboratories, the cork industry, and the ice refrigerator industry have been prepared and are awaiting action.

Of great interest to the refrigeration industry have been the histories of the retail and wholesale codes.

The retail code was sponsored by the National Retail Furniture Association, National Retail Hardware Association, Mail Order Association of America, National Association of Retail Clothiers and Furnishers, National Retail Dry Goods Association, and National Shoe Retailers Association. During the first week in August the wage and hour provisions of this code were approved pending public hearings.

Discussion of and objection to the code revolved largely around price-fixing clauses, which were known as "stop-loss provisions." Under the code, a merchant was required to sell at 10 per cent above the wholesale price of his goods to insure partial payment of employes.

Various interests opposed to this clause—on the basis that it would lead to profiteering and high-markups on goods—were led by the Consumers' Advisory Board.

Presidential approval of the master retail code—which regulates retail operations in all but the food and grocery trades—was secured Oct. 23 and the code became effective Oct. 30. Instead of a general price-fixing clause, the administration inserted a requirement that merchants not be allowed to sell below invoice.

Fears that outside commission salesmen operating under the code could no longer be paid on a commission basis but would be forced to operate on a minimum salary were set aside by Retail Code Order No. 5, which specifically exempts outside salesmen from the minimum wage provisions of the code.

Hearings on a code of fair competition for the wholesale trade (excepting food and grocery wholesalers) were held Nov. 13 under the direction of Division Administrator A. D. Whiteside.

Certain "permissive" provisions of the code, which has not yet been approved, are noteworthy: the selling of goods direct to consumers by wholesalers who also sell through retailers may be subject to regulation, and selling at wholesale prices direct to the public may be prohibited; in any division in which manufacturers sell coincidentally to several classes of buyers, such as wholesalers, retailers, and consumers, the divisional code authority may announce for each product or group of products distributed by its division price differentials between the different classes of buyers which shall be fair and reasonable.

Public Hearings Completed on Code for Refrigerating Machinery Industry

WASHINGTON, D. C.—Hearings on the proposed code of fair competition for the Refrigerating Machinery Industry were completed here Dec. 21. The revised code follows:

Article I—Purposes

To effectuate the policy of Title I of the National Industrial Recovery Act, the following provisions are submitted as the National Industrial Recovery Code for the Refrigerating Machinery Industry. This code is presented to the President for his approval by the Refrigerating Machinery Association in association with Machinery and Allied Products Institute, and upon approval by the President shall be the standard of fair competition for this industry, and shall be binding on each employer therein.

Article II—Definitions

"Applicant" means the Refrigerating Machinery Association, a trade organization which is truly representative of the industry.

"Refrigerating Machinery Industry," or "the Industry" means the engineering, design, and production in the United States of commercial and industrial ice making and refrigerating machinery and equipment incidental thereto. It is expressly stated for the purposes of this code that it is to apply to the engineering, design, manufacture, and sales, as well as erection and/or installation of such machinery and equipment incidental thereto. Any work or process incidental to and carried on by an employer at his plant or elsewhere as a part of the manufacture of any product of the industry shall be governed by the provisions of this code rather than of any other code.

"Person" means a natural person, a partnership, a corporation, or other entity.

"Employer" means any person engaged as a manufacturer in the manufacture for sale of any products of the industry.

"Employee" means anyone who is employed in the industry by any such employer.

"Leaner" means an employee without previous experience on the class of work for which he is engaged, being trained to become competent on one or more machine operations, but who shall not be so classified after ninety (90) days' experience.

"Effective date" means the date upon which this code becomes binding upon the industry.

"Code Authority" means the group which will direct the administration of this code.

"The Act" means Title I of the National Industrial Recovery Act.

"The President" means the President of the United States, and any person to whom he has delegated authority under the act.

"United States" means the continental United States, not including Alaska or the Panama Canal Zone.

Article III—Hours

On and after the effective date no employer shall employ any employee except executive, administrative, supervisory, and technical employees and members of their respective staffs, who are paid at the rate of $35 or more per week, traveling, sales, and service employees, watchmen and firemen, in excess of 40 hours per week; provided, however, that these limitations shall not apply to conditions of seasonal or peak demand which create an unusual and temporary burden for production or installation; in such special cases such number of hours may be worked as are required by the necessities of the situation, but not to exceed 48 hours per week for any six weeks, in any calendar six months' period; and provided further that these limitations shall not apply to employees of emergency, maintenance, and/or repair work, or to highly skilled workers in very special cases where restriction of hours would unavoidably reduce or delay production. Where in any case any employee (other than salaried employees) except executives, administrative, supervisory, and technical employees and members of their respective staffs who are paid at the rate of $35 or more per week, traveling, sales and service employees, watchmen, and firemen, shall work in excess of eight hours per day, at least time and one-third shall be paid for the excess hours worked.

Article IV—Wages

(a) On and after the effective date the minimum wage that shall be paid by any employer to any employee engaged in the production of the products of the industry and in labor operations directly incidental thereto shall be 40 cents per hour, unless the rate per hour for the same class of labor on July 15, 1929, was less than 40 cents, in which case the rate per hour paid shall be not less than the rate per hour paid on July 15, 1929, and provided that in no event shall the rate per hour paid be less than 35 cents, and provided, however, that learners (other than apprentices as defined in paragraph (e) of this Article IV) may be paid not less than 80 per cent of such minimum wage, but the total number of learners employed by any one employer at such reduced rate shall not exceed 5 per cent of the total number of employees of such employer covered by the provisions of this paragraph (a), and provided further, that after three months of work learners shall be paid not less than the minimum wage herein provided.

(b) On and after the effective date the minimum wage that shall be paid by any employer to any employee other than those engaged in the production of the products of the industry and in labor operations directly incidental thereto shall be at the rate of $15 per week, provided, however, that office boys and girls may be paid not less than 80 per cent of such minimum wage, but the total number of such office boys and girls employed by any one employer at such reduced rate shall not exceed 5 per cent of the total number of employees of such employer covered by the provisions of this paragraph (b).

(c) This Article establishes a minimum rate of pay, regardless of whether an employee is compensated on a time-rate, piece-work, or other basis.

(d) Not later than ninety (90) days after the effective date each employer in the industry shall report to the President through the Code Authority the action taken by such employer in adjusting the wage rates for all employees receiving more than the minimum rates provided in paragraphs (a) and (b) of this Article IV, but receiving less than $35 per week of regular work period.

(e) Nothing in this Article IV shall apply to or effect a bona fide apprentice employed under a system or course of training which, when completed, will make the apprentice a skilled mechanic. At no time shall new apprentices be admitted to apprenticeship by any employer when such action will bring their total number to more than 10 per cent of the total number of employees of such employer.

(f) A person whose earning capacity is limited because of age or physical or mental handicap may be employed on light work at a wage below the minimum established by this code, but the total number of such employees employed by any one employer shall not exceed 5 per cent of the total employees of such employer.

Article V—General Labor Provisions

(a) On and after the effective date no employer shall employ anyone under the age of 16 years, or anyone under 18 years of age at operations or occupations hazardous in nature or dangerous to health.

(b) As required by Section 7 (a) of Title I of the National Industrial Recovery Act, it is hereby provided:

"(1) That employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection; (2) that no employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing; and (3) that employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President."

(c) Copies of this code shall be publicly posted by each employer for the direct information of all employees.

(d) Within each State this code shall not supersede any laws of such State imposing more stringent requirements on employers regulating the age of employees, wages, hours of work, or health, fire or general working conditions than under this code.

Article VI—Administration

A Code Authority is hereby constituted to administer, supervise, and facilitate the enforcement of this code.

(a) During the period, not to exceed 60 days, following the effective date of this code, the code committee of the applicant shall constitute a temporary Code Authority. This committee shall consist of eight members, and the President, in his discretion, may appoint one additional member (without vote and without expense to the industry).

To permit representation of employers who are not members of applicant, the latter shall, within 60 days after this code becomes effective, set up a permanent Code Authority to succeed the temporary Code Authority. Such permanent Code Authority shall be elected at a meeting called for this purpose, to which all known employers shall be invited, with the right to vote either in person or by proxy. This permanent Code Authority shall consist of not less than one or more than 12 members, and in addition thereto the Presidential appointee (if any), as referred to in the paragraph above. Of the elective members of Code Authority, one member shall be chosen to represent employers, if any, who are not members of the applicant.

Any employer in the industry shall be eligible for membership in Refrigerating Machinery Association. Any employer in the industry shall be entitled to vote on and share in the benefits of the activities of the Code Authority and may participate in any endeavors of Code Authority in the preparation of any revisions of or additions or supplements to this code by accepting his proper pro rata share of the reasonable cost of creating and administering it, as determined by the Code Authority.

(b) With a view to keeping the President informed as to the observance or nonobservance of this code, and as to whether the industry is taking appropriate steps to effectuate the declared policy of the act, each employer shall prepare and file with such person or organization as Code Authority may designate, and at such times and in such manner as may be prescribed by Code Authority (to be held and used subject to the limitations of this Article VI), statistics of plant capacity, volume of production, volume of sales in units and dollars, orders received, unfilled orders, stocks on hand, inventory, both raw and finished, number of employees, wage rates, employee earnings and hours of work, and such other data or information as the Code Authority may from time to time require.

In addition to information required to be submitted to Code Authority there shall be furnished to Government Agencies such statistical information as the President may deem necessary for the purposes cited in Section 3 (a) of the act.

(c) Except as otherwise provided in the act, all individual statistics, data, and information filed in accordance with the provisions of the code shall be kept confidential; provided, however, that nothing herein shall prevent the publication of general summaries of such statistics, data, and information.

The statistics, data, and information of one employer shall not be revealed to any other employer, except that for the purpose of administering or enforcing the provisions of this code, Code Authority by its duly authorized representatives (who shall not be in the employ of any employer affected by the code) shall have access to any and all statistics, data, and information that may be furnished in accordance with the provisions of this code.

(d) Aggregations of employers having a common interest and common problems may be grouped by Code Authority for administrative purposes into various subdivisions, or product classifications. In each subdivision or product classification there may be a sub-Code Authority approved, or appointed, by Code Authority.

If formal complaint is made to Code Authority that provisions of this code have been violated by any employer, the Code Authority or proper sub-Code Authority may cause such investigation to be made as may be deemed necessary, and shall report the results of such investigation to Code Authority.

(e) It is, however, expressly provided, that the jurisdiction of Code Authority under this code, over any employer shall be limited to that portion of the business and employment of such employer, which is within the industry.

(f) Nothing contained in this code shall constitute the members of the Code Authority partners for any purpose. No member of the Code Authority shall be liable in any manner to anyone for any act of any other member, officer, agent, or employee of the Code Authority exercising reasonable diligence in the conduct of his duties hereunder, nor be liable to anyone for any act or omission to act under the code except for his own willful misfeasance or nonfeasance.

Article VII—Voting

Members of the Code Authority shall be elected by a vote of the employers present in person or by proxy on the basis of one vote for each $1,000 of sales of products of the industry made in the calendar year 1932 as reported to the secretary of applicant, but each employer shall have at least one vote. Voting for members of the Code Authority shall be cumulative. All voting shall be by ballot. Members of the Code Authority to fill vacancies due to death or resignation or other cause shall be elected at a meeting of employers called by Code Authority on at least ten (10) days' notice by registered mail sent to all known employers in the industry. At such meetings the vote shall be taken in the manner hereinabove described.

Article VIII—Sales for Export

The provisions of this code concerning pricing and marketing are not to apply to direct export sales of any product. A similar exemption may be granted by the Code Authority as to sales of any product destined ultimately for export. Unless otherwise determined by the Code Authority, the term "export" shall include shipments to all places outside the United States.

Article IX—Status Prior to Effective Date

Prior to its approval by the President, applicant may at any time change or modify any provision of this code (except those provisions re-

(Concluded on Page 5, Column 3)

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Who Is Getting The Business?

RETAIL sales volume on electric refrigerators has apparently been divided up among fewer dealers this year than ever before. According to the 1932 REFRIGERATION DIRECTORY AND MARKET DATA BOOK, 3.7 per cent of the nation's dealers sold 50.7 per cent of all electric refrigerators purchased, while 18.4 per cent of the dealers sold 80.6 per cent of the total volume. In 1933, it seems, the number of retailers dividing up the lion's share of the year's business was even smaller than last year.

This fact has developed during the course of a survey of the industry's dealers, now being conducted by ELECTRIC REFRIGERATION NEWS with the cooperation of manufacturers, who have given the NEWS access to invaluable confidential information and statistics on their own dealer organizations.

Dealer Body Contracts Materially

First of all, the survey has disclosed that the industry's dealer body has contracted materially. Almost all manufacturers now have fewer dealers on their rosters than they had a couple of years ago. That, coupled with the fact that the number of manufacturers has diminished in the last year, makes it seem obvious that electric refrigeration dealers are not so numerous as in times past.

Still another item to be taken into account is the growth of multiple dealerships—retail outlets which handle two or more different makes of refrigerators. It has not been so long since manufacturers would have been shocked at even the idea of multiple dealerships. But department stores broke the ice, and now—deplorable as it still seems to some manufacturers—the practice of stocking more than one make has become fairly prevalent.

Overlapping of Dealer Organizations

This overlapping of dealer organizations makes it extremely difficult to estimate the total number of dealers in the industry at the moment. Few manufacturers have any accurate idea of the number of retailers on their list which are multiple dealerships.

Perhaps one of the most interesting developments revealed by the survey thus far has been the rise of the department store in importance. Last year reliable sources gave the NEWS a figure of 11.7 per cent as an estimate of the portion of total electric refrigeration sales made through department stores. This year, it would seem from a preliminary study of the data now being obtained in the survey, the figure may be close to 25 per cent. Not a few manufacturers have reported that in any classification-by-volume of their retail outlets, department stores head the list for 1933.

Utilities, which used to account for the biggest share of the industry's distribution, lost ground in 1933—although they were still a highly important factor.

Master retail outlets—controlled by manufacturers or distributors—in metropolitan areas continued to be major merchandisers of electric refrigerators. A few hundred of these aggressive dealerships, combined with less than a hundred strong department and furniture stores, obtained well over half the year's business.

Two Schools of Thought for 1934

What of 1934? There seems to be two schools of thought relative to the proper approach to be made toward dealer organizations next year. One group—which includes in its number some of the oldest and wisest sales heads in the industry—believes it recognizes an inevitable trend toward concentration of retail sales in the hands of fewer and better dealers. The other group—composed largely of "young bloods"—is rarin' to go out and gather up dealers in the highways and byways, to capture the small town market, and to pin their faith to independent dealers.

Salesmanagers of the first group will figure out how to interest strong, thorn-in-the-side competing dealers in switching franchises. Or, they will do the next best thing and try to make exclusive dealers become multiple dealerships. They will most certainly be hot after the department store and furniture store trade. Some of the older manufacturers with strong utility connections have detected renewed signs of life and activity in central station merchandising departments, and are greatly encouraged by the prospect of the old-time vigor on the part of this class of outlet.

More Concentrated Distribution

Still others are moving in the direction of company-owned stores and more master retail outlets (controlled by manufacturer, by distributor, or by both).

Two manufacturers claimed they weren't interested in establishing, or even encouraging, dealers in towns of less than 5,000. Others plan to make strong campaigns to line up small-town dealers—particularly in the South and Far West.

From the Southwest and Pacific Coast, by the way, sales managers are receiving very interesting reports. These sections of the country, it seems, are responding with commendable alacrity to the President's extraordinary efforts to restore prosperity. Their inhabitants seem to have more money to spend, and what's more important, they seem inclined to want to spend it on substantial things like electric refrigerators (in contrast to the East and Middle West, which now are apparently harboring mild Repeal sprees).

More Statistical Knowledge Available

At least one highly important conclusion may be drawn from the sometimes bewildering study of 1933 refrigeration industry statistics: manufacturers seem to know more about their distribution channels than ever before. And, equipped with this knowledge, they are intelligently setting about the task of intense and scientific cultivation of the market for electric refrigeration.

WHAT OTHERS SAY

THE GENERAL ELECTRIC INSTITUTE

THE dedication of the General Electric Institute at Nela Park next Friday, Dec. 22, is well worth special attention at this time, because it indicates the extension of the research facilities of this great company in the direction of study of products as applied to consumer needs.

While General Electric has been at the forefront of scientific research in the electrical field, and while its contributions along this line have been notable, the work of the institute, as we understand it, will go just as far in the direction of insuring the production of goods exactly fitted to the public needs, and developing merchandising plans insuring wide distribution and satisfactory use.

The institute, it seems to us, is being established at an ideal time. It will function in an era when increased study of the consumer and how to serve him is recognized as a necessary complement to broad scientific research. And just as research has paid big dividends in the field of engineering, so it should be equally profitable in making the products of modern industry better suited to the needs of the public, better understood by the user, and more intelligently presented to him through all channels of distribution and advertising.—*Advertising Age*, Dec. 16, 1933.

11 Nema Companies Sell 23,444 Refrigerators in November

Member companies of the Refrigeration Division of the National Electrical Manufacturers Association reporting sales include Crosley, Frigidaire, General Electric, Gibson, Grigsby-Grunow, Kelvinator, Norge, Servel, Trupar, Universal Cooler, and Westinghouse. Member companies not reporting sales are Merchant & Evans Co., Potter Refrigerator Corp., Stewart-Warner Co., Sunbeam Electric Mfg. Co., Uniflow Mfg. Co., and Rudolph Wurlitzer, Inc.

	WORLD SALES		U. S. A. INVENTORIES			
			Factory, Branch, & Warehouse		Dealers and Distributors	
HOUSEHOLD						
Lacquer (Ext.) Cabinets With Systems	Quantity	Dollars	Quantity	Dollars	Quantity	Dollars
1. Under 4.00 cubic feet	948	52,387	333	20,542	1,157	62,560
2. 4 to 4.99 cubic feet	9,178	606,567	32,605	2,280,809	21,053	1,424,410
3. 5 to 5.99 cubic feet	1,951	148,826	10,709	811,228	7,779	586,334
4. 6 to 6.99 cubic feet	2,623	220,427	11,158	975,345	11,372	1,011,848
5. 7 to 7.99 cubic feet	1,479	159,922	17,169	1,884,295	7,917	857,944
6. 8 to 9.99 cubic feet	175	21,286	1,325	179,132	1,641	204,641
7. 10 to 12.99 cubic feet	33	6,536	501	92,747	311	61,400
8. 13 to 16.99 cubic feet	9	2,084	151	32,104	68	15,258
9. 17 to 24.00 cubic feet	4	1,247	49	12,872	39	10,343
10. Total lacquer	**16,400**	**1,219,282**	**74,000**	**6,289,074**	**51,337**	**4,234,738**
Porcelain (Ext.) Cabinets With Systems						
11. Under 4.00 cubic feet	13	797	48	2,995	88	5,012
12. 4 to 4.99 cubic feet	936	71,300	9,589	877,570	3,020	261,794
13. 5 to 5.99 cubic feet	435	41,973	1,185	110,904	1,989	195,842
14. 6 to 6.99 cubic feet	1,621	166,373	5,969	610,837	5,441	594,650
15. 7 to 7.99 cubic feet	1,591	196,635	15,318	1,973,938	7,229	930,992
16. 8 to 9.99 cubic feet	708	97,644	2,938	414,475	2,562	371,899
17. 10 to 12.99 cubic feet	279	46,799	1,202	210,313	887	161,798
18. 13 to 16.99 cubic feet	115	22,457	656	133,867	393	84,310
19. 17 to 24.00 cubic feet	11	3,772	293	78,065	162	48,765
20. Total porcelain	**5,709**	**647,750**	**37,198**	**4,412,964**	**21,771**	**2,655,062**
21. Total lines 10 & 20	**22,109**	**1,867,032**	**111,198**	**10,702,038**	**73,108**	**6,889,800**
22. Separate systems	641	23,676	4,879	210,071	700	23,050
23. Separate household low sides	694	11,079	2,976	56,253	657	12,807
24. Total lines 21, 22, & 23	**23,444**	.....	**119,053**	.....	**74,465**	.....
25. High sides under ½ hp.	976	42,345	1,936	96,239	427	22,112
26. Cabinets—no systems	49	3,218	25,288	1,356,572	93	6,482
27.	.....	.....	.....	.....	.....	.....
28. Totals Household	.....	**1,947,350**	.....	**12,421,173**	.....	**6,954,251**
COMMERCIAL						
31. Water coolers with high sides	652	54,115	6,726	669,755	3,232	330,960
32. Water coolers with no high sides	84	3,983	3,003	105,620	170	7,592
33. Ice cream cabinets with high sides	122	12,690	2,306	314,203	99	12,248
34. Ice cream cabinets with no high sides	88	10,219	3,957	473,347	257	29,092
35. Milk coolers with no high sides	.....	.....	7	1,296	30	5,555
36. Room coolers with high sides	.....	.....	2	1,045	1	523
37. Room coolers with no high sides	27	2,672	1,501	150,633	297	27,474
38. Extra high sides, ½ hp. up	3,017	287,276	11,006	1,263,874	3,880	478,943
39. Total lines 31, 33, 36, 33, & 42	**3,912**	.....	**22,499**	.....	**7,818**	.....
40. Extra com. low sides	2,842	91,631	19,924	666,076	4,848	174,863
41. Misc. cases & cabinets	.....	123,674	.....	346,852	.....	94,798
42. Beverage coolers	121	6,625	2,459	148,830	606	37,632
43. Totals Commercial	.....	**592,885**	.....	**4,141,531**	.....	**1,199,680**
44. Totals—Household and Commercial	.....	**2,540,235**	.....	***16,679,740**	.....	****8,153,931**

*The total of the figures by sizes and kinds does not agree with the total figure shown, namely $16,679,704, because of the failure to supply detailed information by all companies. The number of companies reporting inventories at factory, branch, and warehouse was 10. The percentage of total sales of these 10 companies was 96.7%.

**The number of companies reporting inventories of dealers and distributors was 9. The percentage of total sales of these 9 companies was 94.4%.

Nema Distribution By States

STATES and Territories	Quantity of HOUSEHOLD Low Sides
Connecticut	150
Maine	41
Massachusetts	430
New Hampshire	38
Rhode Island	99
Vermont	23
New England Total	**781**
Delaware	22
Maryland & D. C.	359
New Jersey	738
New York (State)	5,394
Pennsylvania	1,018
Eastern Total	**7,531**
Kentucky	57
Ohio	670
West Virginia	82
East Central Total	**809**
Alabama	69
Florida	264
Georgia	31
North Carolina	102
South Carolina	36
Tennessee	131
Virginia	136
Southeastern Total	**769**
Illinois	902
Indiana	183
Michigan	693
Wisconsin	131
Great Lakes Total	**1,909**
Minnesota	239
North Dakota	27
South Dakota	67
North Central Total	**333**
Iowa	203
Kansas	177
Missouri	290
Nebraska	124
Middle West Total	**794**
Arizona	9
California	1,274
Nevada	10
Pacific Coast Total	**1,293**
Idaho	19
Montana	17
Oregon	34
Utah	15
Washington	132
Northwestern Total	**217**
Colorado	74
New Mexico	10
Wyoming	15
Rocky Mountain Total	**99**
Arkansas	34
Louisiana	110
Mississippi	44
Oklahoma	100
Texas	393
Southwestern Total	**681**
U. S. Miscellaneous	5
Total United States	**15,221**
Total Canada	355
Other Foreign (Including U. S. Possessions)	7,868
Total for World	**23,444**

BURRITT SAYS BUSINESS IS DEPENDENT ON CREDIT

DETROIT—In a message sent to Kelvinator's dealer-salesman organization last week, H. W. Burritt, vice president of the company, stated that continued betterment of business conditions is dependent upon "an increase in the velocity and turnover of credit."

"In other words," he explained, "the one thing now needed in our business setup is a speeding up of the exchange of dollars, labor, and commodities. Recent developments have had their origin, directly or indirectly, in a desire to aid this speeding-up process."

Factors mentioned by Mr. Burritt as important in the acceleration of business include the public works program, circulation of earned money, recognition of Russia, and repeal of the eighteenth amendment.

Point stressed by Mr. Burritt in his message was this: "Whether we understand or . . . approve the monetary policies now in force . . . there is no desire expressed by any group or by any individual for a policy which would lower price levels.

"On the contrary, there is a substantial agreement either that commodity prices must be stabilized where they are, or advanced to new and higher levels. This thinking encourages the exchange of dollars for commodities.

"That these agencies are making their influence felt is evidenced by the fact that employment figures and payrolls continue on the upgrade despite the lag in heavy industries. Recent months have brought the highest employment gains of the year."

Referring to 1933 events, he said:

"Due to the price situation that existed between March 11 and Sept. 1, it is undoubtedly true that some portion of our normally anticipated fall business was done in May and June or even earlier.

"The public bought sooner than it otherwise would have done to escape the price penalty of delay. Even so, current sales are holding up well and the total volume this fall has been greater than that of a year ago.

"Unreasoning and unreasonable price cutting seems to be disappearing. Manufacturers have apparently realized that not even a temporary advantage was to be gained by price slashing tactics, since within the industry there would always be other manufacturers, adequately financed and determined to protect their distributors and dealers through the repricing of their own lines even to the actual elimination of profit."

Contributions of Electricity to Home Are Praised by Owen D. Young

(*Concluded from Page 1, Column 5*)

the front of one building was an electrical Christmas greeting card.

Friday night and over the week-end thousands of Clevelanders drove through Nela Park to see the illumination.

Many notables of the utility world were present at the dedication, as were advertising agency presidents Lon Maxon and Charles Francis Coe (the latter made two extemporaneous radio addresses describing the dedicatory ceremonies and the institute).

Mr. Young's complete address ran as follows:

"There are only three rooms in a house. No big house has more than three, no matter what the numerical count may be. No small house has less than three, however cramped the quarters may be; a kitchen, a setting room, and a bedroom. These are the heart of a house.

Kitchen Must Be Convenient

"Less we can not have and more we can not use. The kitchen, which is the work shop, must be convenient in layout and efficient in equipment. The setting room must be attractive and comfortable. The bedroom must be quiet and airy. Then we have the physical essentials of a home.

"No citizen in this land should be so poor as to have less and no citizen of this land can ever be so rich as to buy more. So our problem is how to provide these things for the people of the United States.

"It is to that the General Electric Co. is endeavoring to contribute by the establishment of the General Electric Institute here at Nela Park in Cleveland.

Play Room for Children

"There is one more important room, and I think only one, and that is a play room and sleeping room for the children. Commonly, it is called a nursery—frankly, I do not like the name. It suggests the nurture of plants and shrubs and physical bodies and stops there.

"Perhaps we can find a new name which will in addition carry the connotation of the nurture of the mind and heart. These researches here have done much but not enough—not anywhere nearly enough, for this children's room.

"Now let me talk about the kitchen, for in it lie my first memories and my dearest recollections. Knowing how bad the old kitchen was, I know how much better the new kitchen is. The kerosene lamp, which always smoked in the slightest draft, no matter how carefully the wick was trimmed, would look strangely out of place in this new kitchen here. It not only did not give much light the night before, but it gave much work the morning after.

Old Cook Stove

"The wet wood sizzling in the kitchen stove demanded a competent and assiduous fireman, and the varying heat of the oven turned out pies either so pale that they looked as if they might faint away, or so seared as if they might blow away. The constant heat of the electric range, carefully regulated and timed, removes not only the effort to keep a fire going, but the nervous strain of carrying to a critical table, sometimes too vocal for a mother's sensitive nature, the unsatisfactory output of an old oven.

"And I never think of the old kitchen without the horror of Monday morning and its washing—the steaming boiler on the stove, the wash tub and the wringer, and the smell of suds. I am sure that the name of blue Monday came out of the old kitchen.

"It reflected a tired woman's face, an unsatisfactory dinner for hungry men, discouragement and general depression, which even cast its shadow on the quiet of the Sunday afternoon and evening before. If electricity did nothing more than to destroy blue Monday, it would have made an immeasurable contribution to the American home.

Cellar Refrigerator

"The swinging shelves in the old cellar were certainly not a satisfactory nor a convenient refrigerator. The dark cellar stairs with worn treads reflected the slavery of the woman who laboriously and dangerously travelled them so many times each day.

"If electricity had done nothing more than to preserve the food, protect the food, and to save the worn treads of the cellar stairs, it would have rendered an immeasurable service to the American home.

"One does not need to recall the Tuesday morning ironing with its piping stove in the heat of summer to be thankful for the electric iron, or even to remember the dusty sweepings of the setting room to be thankful for the vacuum cleaner. Then, too, three times a day and every day, that unending dish washing and the accusing drying towel facing a half grown boy.. "I say accusing because either he took it and wiped mother's dishes, thereby interrupting his book, his study, or his play, or else he did not take it and had a twinge of conscience within and an appearance of absent-mindedness without, comparable only to that of the seated man in the street car when the lady enters. If the modern dishwasher and dryer will remove the stinging indictment of the drying towel from the lives of the youth of this country, electricity will have made a great contribution not only to the ease of their lives, but to the relief of their consciences as well.

"I welcome the modern kitchen to the American home, and I am proud of the research and effort which the General Electric Co. is making in that field. After all, however efficient great power stations may be, whatever relief may come from vast installations in great industries, the thing which touches human lives and affects human lives and affects human happiness most is found not in the majestic revolutions of a great turbine, but in that most delicate machinery in our kitchen, delicate not in its character and construction, but delicate in that reflex which mother casts on the spirit of the house.

"If you add to these that lighting which makes a setting room cheerful as well as useful, a radio which brings the world to it from without, and automatic air conditioning which makes you comfortable always, then conversation between the living, and conference through our books with them no longer living, will flourish in a congenial atmosphere and aid our culture, happiness, and self-respect, which, after all, is the aim of life.

"It is to this great undertaking that we dedicate the General Electric Institute."

Kitchen Planning

To study means whereby the daily kitchen routine of the average housewife can be shortened, made easier, and accomplished efficiently in a convenient modern environment, a complete kitchen section is a part of the new General Electric Institute which was dedicated here.

The kitchen section includes a number of model kitchens, model laundry, class-room kitchens where home economists may be trained, deluxe kitchen, and a laboratory kitchen, where 14 may cook at one time and where recipes may be tested and new ideas of kitchen management, meal preparation, and food preservation may be originated.

In addition, there is an architectural service department where designers, architects, and interior decorators already are busy designing kitchens for new homes and drawing plans for the remodeling of kitchens in old homes and apartments. The function of this staff is to assist home owners, architects, and builders in constructing, remodeling, and modernizing kitchens.

In the architectural planning department, members of the staff also train specialists who go out in the field to work with home owners and architects.

Designers at the institute consult with the home economics staff on matters of efficient layout and convenient placing of equipment. On questions of illumination and lighting fixtures they have the benefit of expert counsel from Nela Park's lighting engineers.

Research Kitchen

The research laboratory kitchen is the heart of the kitchen section of the General Electric Institute. It is a testing laboratory for new recipes and new ideas in the preparation and serving of meals, a proving ground for electrical household appliances, a clearing house for information and helpful advice on home making, a training school for sales representatives and the women who become home service directors for dealers, distributors, and public utilities.

While the deluxe kitchen at the institute is for the larger home, the same design may be scaled down to fit other homes where both space and budgets are more limited. The electric dishwasher is the middle unit in a long unbroken line of working surface extending from a big double-door refrigerator to the electric range. Designers explain that this is for a continuous straight-line production in preservation, preparation and serving of food, and cleaning of dishes.

The kitchen also includes a planning desk where the housewife may plan her meals, order her foodstuffs, and keep her food account books and recipes.

Racks for kitchen towels are hidden, with a heating unit to dry the towels. A concealed electric water heater furnishes an abundant supply of hot water. Beneath the sink is a concealed garbage container, the lid of which lifts automatically when the door is opened. There are also an electric clock, electric mixer, toaster, and percolator in this kitchen, which has recessed lighting and air conditioning.

HEARINGS COMPLETED ON MACHINERY CODE

(*Concluded from Page 3, Column 5*)

quired by Sections 7 (a) and 10 (b) of the act), or may withdraw this code.

The applicant will not be deemed to have consented to any change or modification of this code which may be affected by the President's order of approval, unless such change or modification is submitted to the applicant and consented to by the applicant.

Article X—Modifications

(a) As provided by Section 10 (b) of the act, the President may from time to time cancel or modify any order, approval, license, rule, or regulation issued under Title I of the act.

(b) This code is intended to be a basic code. Study of the trade practices of the industry will be continued by Code Authority, with the intention of submitting, from time to time, after its effective date, additions to, or revisions of, or supplements to, this code.

Any such amendments, additions, revisions, or supplements, proposed by Code Authority and approved by 60 per cent of the dollar volume of the industry shall be in full force and effect from and after approval by the President.

Article XI—Term and Termination Of This Code

After its effective date, this code shall continue in effect, for a period of 120 days (called the initial period) and thereafter until terminated by operation of law, or terminated as provided in this Article XI.

At any time after initial period, applicant may submit to its members, a proposal to terminate the operation of this code, on a date, (to be fixed in said proposal) not less than thirty (30) days after the expiration of said initial period.

If and when by a two-thirds vote of the members of applicant they shall approve and adopt said proposal, applicant shall so notify the President, and upon the filing of such notice, this code shall cease to be in effect.

When so terminated, all obligations and liabilities under the code shall cease, except for unpaid assessments theretofore made in accordance with the provisions of the code, and those for liquidated damages theretofore accrued under any provision of the code.

Article XII—Monopolies

Applicant imposes and shall impose no inequitable restrictions on membership therein. The code presented by it is not designed to promote monopoly, and shall not be so construed or applied as to oppress or eliminate small enterprises or discriminate against them, and is designed to effectuate the policy of the act.

Article XIII—Effective Date

This code shall become effective and binding on all persons engaged in the industry on the eleventh day after its approval by the President, and shall not be otherwise effective.

LANGE, SPOEHRERS WILL START CONTROLS FIRM

ST. LOUIS—H. T. Lange and H. F. Spoehrer, vice president and chief engineer and secretary-treasurer, respectively, of the Alco Valve Co. here, have resigned from that organization, their resignations effective at the end of this month.

These men, with C. H. Spoehrer, brother of Alco's secretary-treasurer, have organized the Trojan Co., Inc., to manufacture and distribute automatic control devices for refrigeration and air conditioning.

NATURAL CAVE USED TO CONDITION HOME

EAST PITTSBURGH, Pa.—A case of natural air conditioning, whereby a house is air conditioned by a flow of cool air from a cave underground, is related by J. C. Speer, manager of air-conditioning products of the Westinghouse Electric & Mfg. Co.

The house is the property of an editor of a Decorah, Iowa, newspaper. The novel ventilation system cools his home in summer and helps to warm it in winter.

"When the foundation of his home was being excavated," said Mr. Speer, "workmen struck a small crevice in the rock. Cool air gushed from this crevice which is about 2½ ft. wide and extends into the rock 20 ft. and then makes a turn. Beyond this turn the crevice has not been explored.

"A large sized tin pipe was forced into the crevice in order to convey the cool air into the house. Part of the air is conducted to the kitchen where it maintains an even temperature throughout the summer and keeps food in excellent condition. The rest is piped to a room used as an office by the editor. An electric fan located in the pipe line helps draw the cool air into the house. Other fans circulate the air throughout the house."

Air from the crevice maintains an even temperature the year 'round, according to the Westinghouse air-conditioning manager. As a result, the house is cooled during the hot summer months and is heated when winter's icy blasts prevail.

The little extra work required to pipe into the house this air, conditioned by nature, has repaid the owner many times in year 'round comfort, Mr. Speer declares. It is the only known case of a cave being put to work to air condition a house.

COMING

AN OUTSTANDING SERVI
THE ★ 1934 ★ REFRIGERA

To Subscribers—

Many subscriptions expire at the end of the calendar year. Take advantage of this opportunity to renew your subscription and place your order for a copy of the 1934 Directory. The following reduced rates are for the United States and countries in the Pan-American Postal Union:

	Electric Refrigeration News (1 Year)	1934 Directory	Total Cost	Combination Rate	You Save
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ERVICE TO THE REFRIGERATION INDUSTRY—
GERATION DIRECTORY AND MARKET DATA BOOK

To Advertisers—

The New ★ 1934 ★ Refrigeration Directory & Market Data Book will soon be on your Customer's Desk

IF you sell to Refrigeration Manufacturers—Distributors or Dealers, act now and get your advertisement ready in time for the new 1934 Refrigeration Directory and Market Data Book. This Directory will soon be on your known and unknown customer-prospect's desk—and it will be on the job for you whenever purchasing is planned.

This year the refrigeration industry has already sold over a million refrigerators, the largest number of refrigerators in its history, and there is every indication at present that the 1934 refrigeration business will set new records.

Consider the part that the Refrigeration Directory and Market Data Book can play in helping you get a larger share of next year's business.

First issued in 1932, the Directory filled a big demand for facts and figures on all phases of the refrigeration business. Potential buyers of equipment and services have turned to the Directory for their needed information and in its two years of service the Directory and Market Data Book has been a potent factor in bringing these potential buyers in contact with sources of supplies. Its faculty for being on the job when equipment buying orders are planned has made it a most profitable source of business for its advertisers.

Features of the 1934 Directory

SPECIFICATIONS of all models and all makes of household and commercial refrigerating units.

STATISTIC—Facts and figures on past sales and methods of distribution.

CLASSIFIED listing of refrigeration equipment, parts and supplies with names of all manufacturers.

TRADE NAMES of refrigeration products alphabetically listed.

GEOGRAPHICAL listing of all manufacturers.

ALPHABETIC listing of all manufacturers.

With this background of service, the Refrigeration Directory and Market Data Book has industry acceptance today which will make advertising in the new 1934 edition of greater value than ever before.

The 1934 edition of the Refrigeration Directory and Market Data Book is a logical, practical advertising medium for every manufacturer of refrigeration equipment and for every manufacturer, large or small, who sells supplies or service to this great industry because:

1. The Directory is the recognized industry register of all trade-marked refrigeration products.

2. It is the buyers' guide for engineering, production, and purchasing executives.

3. It is the handbook for all the suppliers who serve the industry.

4. It is the encyclopedia of information for present and prospective distributors and dealers.

Already many manufacturers have made reservation for their selling message to supplement the free listings of their products. If you have not already done so may we suggest that you do so at once.

Advertising Forms Close Feb. 1st. Reserve Your Space Today—
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T IN BINDING

SURVEY OF AIR CONDITIONING IN TWELVE LARGE CITIES

1933 a Record Year for Most Cities In Number of Installations Made

E, W. Lloyd Reviews Progress of Air Conditioning Giving Data on Classes of Installations

(*Continued from Page 1, Column 3*)

tory, gave a table of facts about installations on its lines, and discussed the various types of prospects for additional equipment.

CHICAGO

First city reported on was Chicago, which is served by Mr. Lloyd's own company, the Commonwealth Edison Co. Mr. Lloyd's report follows:

Present Status

A survey was made in Chicago early this year to find and compile the information on all air-conditioning installations made *prior* to 1933. This information is shown in Table 3.

TABLE 3—Installations Made in Chicago Prior to 1933

Class of Establishment	Number of Installations	Refrigeration Tonnage	Hp. Connected
Banks	3	302	529
Bakeries	6	107	193
Board of Trade and Stock Exchange	2	225	548
Candy and Confectionery	14	1,194	2,205
Hotels	12	1,010	2,553
Office Buildings and Offices	24	1,705	2,376
Printing and Lithographing	8	285	458
Residences	20	30	30
Restaurants	22	673	1,056
Stores, Retail	15	603	1,236
Theaters	37	6,938	12,539
Miscellaneous	13	893	1,653
Total	**176**	**13,965**	**25,376**

From the table it is seen that the average tonnage of refrigeration per installation was about 80 and the average horsepower connected 144. These figures cannot be taken as a criterion as it is logical that the leading theaters, banks, restaurants, stores, and industries would be first to apply any new principles which gave promise of improvement over the conditions and difficulties prevalent.

TABLE 4—Class of Installations Made in Chicago During 1933 to Aug. 31

Class of Establishment	Number	Hp.
Art Institute	1	30
Brokers Rooms	2	21½
Clubs (Lounge)	1	2
Churches	1	5
Dancing Academies	2	8
Exhibits	3	18
Funeral Homes	1	5
Hotels	1	27½
Malt Manufacturer	1	57½
Metal Cap Manufacturer	1	26
Mushroom Storage	1	1
Office Building	2	112½
Offices, Private	37	91
Paper Box Manufacturer	1	112½
Planetarium	1	116½
Printing Establishment	1	75
Residences	11	15¼
Restaurants and Cafes	27	622
Stores, Candy and Food	6	14
Stores, Clothing, etc	5	20¼
Studio (Radio)	1	9
Theaters	11	517½
Window Shade Manufacturer	1	20
Woolworth Store	1	440
Total	**120**	**2,367**

Tables 4 and 5 show the installations made between Jan. 1 and Sept. 1, 1933. The average tonnages and horsepower connected for the various classes of installations are probably a better criterion of what may be expected as a general run of applications in the immediate future.

It is noted that some of the installations run up to 400 hp., 19 are above 30 hp., and the remaining 101 are of sizes of from ⅝ hp. and up to 30 hp. In the group above 30 hp., theaters represent the largest group, which would indicate that practically every solvent theater is an immediate prospect.

Other public gathering places, which includes ballrooms, auditoriums, night clubs, etc. can be placed in the same category, as the public during 1933 has given definite indications that it will give its patronage where its comfort is catered to.

In the group having installed capacities below 30 hp., restaurants and business offices have been the most easily sold this summer.

In the restaurant field it is well to have a clear picture of the problems. On the one hand is a group of food dispensers each with a personality trying to build up a patronage based on prestige and quality, or catering to the specialized tastes of certain groups. In this group are some very famous names known the world over. Every establishment of this class is an immediate prospect.

The remainder of the restaurant group ranges in size from the hamburger and red hot stands on up through the scale to the level of high-grade neighborhood establishments enjoying an excellent patronage of high-grade citizens in their immediate locality. The latter are of course good prospects but with a less desirable credit rating.

Several Interesting Installations

During the decade prior to 1933 several department stores had installed air conditioning in connection with the modernization of the basements of their buildings and conversion into bargain counter sales space. None of these installations was considered as much of a forward step, as it was recognized that underground space needed treatment of some sort to be habitable by either workers or customers.

TABLE 5—Time of Installation of Equipment in Chicago During 1933

Month	Number	Hp.
First Quarter	5	325
April	7	187
May	13	961
June	32	454
July	40	329
August	23	1,111
Total	**120**	**2,367**
Installations made on Century of Progress Grounds	22	500
Total, 8 Months	**142**	**2,867**

Prior to the spring of 1933 the only large installation of air conditioning in merchandising space above ground in Chicago was the Edison Electric Shop.

As a consequence considerable surprise resulted in retail circles from the announcement last spring that F. W. Woolworth & Co., would completely air condition their large store at 18 North State St. This store is housed in a 10-story building erected during 1928, and occupies the whole first floor and basement.

A complete mechanical ventilating system with ceiling outlets was installed as part of the original building and was suitable for the purpose of air conditioning with very minor alterations. Neiler, Rich & Co. of Chicago were consulting and designing engineers for the Woolworth company. The tabulation in Table 6 prepared by them gives the major details in connection with the installation.

Since its official completion for operation early in May, this installation has been giving a remarkable account of itself. During the early summer period when for over a week Chicago had daytime peak temperatures of about 100° F., this store was packed all the time, whereas, other stores within a block of it, and particularly those having basements not conditioned, were doing very little business.

TABLE 6—Installation in Woolworth Store, Chicago

Square feet of floor space	59,225
Cubical contents of conditioned space	754,490
Number of persons provided for	2,540
Wattage of lamps	106,550
Tons capacity of refrigeration (Carrier Centrifugal) installed	240
Horsepower on refrigerating machine	300
Cubic feet of air circulated per minute	96,900
Horsepower on fans	20 & 25
Gallons per minute of cooled water circulated through spray	700
Horsepower on water pump	40
Horsepower on refrigeration pump	1
Horsepower on purge pump	2
Total horsepower refrigeration	303
Total horsepower ventilation	85
Estimated Energy Use and Cost	
Refrigeration 12 hours per day, 100 days per year—301,300 kwhr	$4,518.00*
Ventilation 12 hours per day, 308 days per year—258,720 kwhr	3,885.80*
Total estimated C. E. Co. annual revenue	$8,403.80
Estimated annual water cost	1,918.00
Total operating cost per year	10,321.80
Operating cost per square foot of space per year	0.17
Summer operating cost per day	76.53
Winter operating cost per day (exclusive of heating)	12.35

*Actual revenue for July, 1933, was slightly above the basis of this estimate.

Some of our people questioned salespeople for their reactions and the invariable answer was that they hated to leave the place in the evening. Similar comments from customers were overheard in passing about the floor.

Another comment heard both on and off the premises whenever the installation is being discussed is "that the lowly 5 and 10 seems to have set a pace which the leaders in the merchandising field certainly cannot ignore."

Another interesting installation in Chicago which seems to point a moral is the case of an office building fronting on a street having both surface and elevated railways, and a main boulevard on its side street. Quoting from a letter from Aldis Browne of Ross & Browne, which manages and operates the building:

"The Morton building is a 23-story modern office structure, which was completed in 1927. The second floor of the building, comprising approximately 15,000 sq. ft., presented a difficult problem from a leasing angle because of the noise and dirt created by the street cars and the elevated railroad at this busy intersection.

"As a result of this handicap we were unable to secure a desirable tenant for this floor at an equitable rental, and the space remained untenanted while the floor above enjoyed an average occupance of 90 per cent.

"Last winter our architects were consulted as to method of eliminating these disadvantages and the resulting plan, which was adopted, included air conditioning, accoustical treatment of ceilings and window frames, and the installation of double windows to eliminate exterior noises.

"The air-conditioning system has proved most gratifying. Temperature, humidity, and the general comfort conditions approach the ideal, and the noise level has been so reduced that all exterior noises pass unnoticed. We are continually receiving favorable comments on the desirability of these offices. Our decision to completely condition this space resulted in its becoming a profitable, income-producing unit, after having been unoccupied for the greatest part of the time since 1927."

The Burroughs Adding Machine Co. are the tenants and all those consulted, ranging from the information girl to the manager, are unanimous in their praise of the conditions since the new air-conditioning plant has been in operation. The remarkable thing about it is that the noise level, by actual measurement, is below that existing on the 37th floor of a skyscraper in a relatively quiet section of the loop. The general data on this installation are given in Table 7.

Immediate Future Prospects

Office Buildings

In every large city there are a number of large office buildings for which the owners claim first importance because of location, architecture, height, priority or "what have you." In Chicago this situation exists as elsewhere, but a new note was sounded on June 28, 1933, when the Chicago *Tribune* had a ¾-column editorial announcing to the world that its officials had decided to completely air condition the *Tribune* Tower building.

The editorial frankly stated that air conditioning was bound to come in its general application and that the *Tribune* preferred to be first rather than accept the inevitable and have it forced upon them as a matter of keeping in step with modern trends.

Since the appearance of the *Tribune* editorial, several large office buildings have had surveys made regarding the feasibility and cost of similar modernization of their structures.

Among other features in the analysis of the *Tribune* building, the use of steam for the production of refrigeration will be given close study. In all past cases where steam-jet refrigeration has been in competition with electrically driven compressors, decisions have been made on the basis of the relative desirability of low first cost as against low operating costs.

In some cases in the past low first cost has been of prime importance but in the case of the *Tribune* building it is almost a foregone conclusion that all elements will be balanced and given full weight.

No complete data are yet available but a casual consideration would lead to the opinion that the first cost of refrigeration machinery may be of less overall significance in an installation of this kind which requires unusually heavy expenditures in air distribution and architectural changes to the present building.

Department Stores

Several of our Chicago merchandising establishments enjoy somewhat of a national reputation and everything possible is being done to impress upon them the fact that in air conditioning they are behind the times as compared to similar establishments in other cities. In my opinion real progress will be made in this group in a reasonable time.

Theaters

Upward of 50 of the 300 theaters in Chicago are now completely equipped. This includes all of the Class A motion picture theaters. Many of the remainder also have ventilation systems and some have ice- or water-cooling systems. With the remainder of the outlying theaters running only evenings, and some of them only on week-ends it is simply a matter of income and it is unlikely that all of them will ever be able to afford complete air conditioning.

According to the best estimates we can make the houses now conditioned represent over 50 per cent of the total available load. Nevertheless our experience of 1933 shows that the theater field is still an important one for load building.

Some business men have gotten along in very objectionable office quarters for years and have in a measure gloried in their martyrdom. After several visits to friends' offices, which are comfortable the year round, the virtue of martyrdom seems to be too little reward for enduring the heat and noise, and another private office joins the ranks. This effect should be cumulative.

Along the same line once a man has his office conditioned, an installation in his home usually follows either as a result of his own reactions or as a result of a visit from his wife.

How Should the Utility Aid the Development of the Industry?

That the utilities are today alive to the possibilities in the air-conditioning field is taken for granted. Practically all of the companies within and surrounding the centers of population have already entered the field in some way. The only question which in some instances is still to be decided is whether the utilities should:

1—Engage in the actual merchandising of one or several lines of equipment or

2—Aggressively stimulate, promote, and sell the idea of air conditioning but leave the selling to others.

I believe it will be agreed by all that the utility should act as a coordinator in the field for the protection of itself, its customers, and even for the prevention of chaotic conditions between the various competitors in the field. Of course, every manufacturer would like to have, and feels entitled to have, the utility merchandise its product as it adds tremendously to the manufacturer's prestige.

As soon as a utility does take over a sales franchise for one or more lines, it in effect, does just that. Of course, it can take on other lines but there is a limit, and as a consequence its own hands are tied for the future.

An alternative is for the utility to sign no franchises and merchandise no equipment but to aggressively stimulate the business by all methods of advertising, demonstrations, and solicitation. The company can originate many negotiations between the equipment vendor and customer.

If it has the necessary personnel to do so, the utility may if it so desires, act as the customer's consultant and advisor until the installation is complete.

The utility should by all means keep itself in such a position that all classes of persons, groups, or organizations interested in the sale or development of plans, methods, equipment, and service to further the air-conditioning field, will come to it freely for a frank and friendly discussion of its plans. Further than this, the utility should be ready to extend a friendly cooperation to all, subject of course, to limitations as to the financial burden involved.

Reports on air conditioning by 11 other utility companies holding mem-

(*Continued on Page 9, Column 1*)

TABLE 7—Installation in Morton Building, Chicago

Square feet of space conditioned	13,000
Cubical contents space conditioned	130,000
Number of persons normally occupying space	110
Wattage of lighting within space	22,000
Tons capacity of refrigeration machine (Brunswick Kroeschell Co.) installed	30
Horsepower on refrigeration machine	30
Cubic feet of air circulated per minute	15,200
Horsepower on fans (supply)	7½
Horsepower on fans (exhaust)	3
Gallons cold water circulated per minute	100
Horsepower on cold water pump	3
Total horsepower on refrigeration	30
Total horsepower on ventilation	13½
Estimated Energy Use and Cost	
Refrigeration 12 hours per day for 104 days @ 277.7 kwhr per day (test) = 28,878 kwhr =	$577.57
Ventilation 13 hours per day for 308 days per year @ 108.29 kwhr per day (test) = 33,786 kwhr =	675.72
Total estimated C. E. Co. annual revenue	$1,253.29
Ventilation cost per day	2.19
Refrigeration cost per day	5.55
Power cost per square foot per year	.096
Investment in air conditioning per square foot of space	1.00
Investment in architectural and acoustical treatment per square foot of space	.47

4 CITIES SUMMARIZE AIR-COOLING WORK

(*Continued from Page 8, Column 5*)

bership in the Association of Edison Illuminating Companies were included in Mr. Lloyd's survey. These follow:

CLEVELAND

By G. E. Miller
Cleveland Electric Illuminating Co.

In our estimates of revenue we use a much lower figure per horsepower than you do. Our tests and estimates indicate an average annual revenue of approximately $11.20 per horsepower. (See Table 8.)

As soon as business returns to a more normal and stable condition, air-conditioning sales will increase here.

TABLE 8—Installations in Cleveland To August 15, 1933

Class of Establishment	Number of Installations	Hp. Connected	*Estimated Annual Revenue
Offices	8	68	$ 935
Printing and Lithographing	1	74	2,600
Residences	6	20	350
Restaurants	8	†131	1,515
Stores, Retail	4	2,400	18,740
Theaters	9	2,754	31,985
Miscellaneous	4	258	7,890
Total	**40**	**5,705**	**$64,015**

*Note: The revenue derived from this load is estimated from meter tests and knowledge of the operating practice of the plants. The variation in revenue from the different types of installations is due principally to the difference in the increment rate which applies.

†One of our largest installations is in the Harvey restaurant in the Terminal Railroad Station. This is a steam plant, for which we supply the steam. This is not included in above figures.

DETROIT

By A. D. McLay, Detroit Edison Co.

We have been going along with air conditioning for a number of years, but it is only in the past year or two that the small jobs have come forward.

Table 9 gives a list of installations made in 1933, with their size indicated in horsepower. You will note that these total 289 hp. so far in 1933. These are all small jobs, ranging from 1½ to 30 hp.

TABLE 9—Installations Made in Detroit During 1933

Installation	Hp.
Cunningham Drug Store (Griswold)	30
Cunningham Drug Store (Dexter and Webb)	8
Shapero Drug Store	10½
Trans-Lux Theater	30
Rheames Restaurant	30
Fischer German Restaurant	10
Fort Shelby Coffee Shop	10
Sanders, Eaton Tower	12
Goody Nut Shop (United Artists)	3
Goody Nut Shop (Fox Theater)	..
Sallan's Jewelry	6
Freidburgs Jewelry	10
Maude Fleming Hair Shop	8
Wm. R. Hamilton & Co.	3
Detroit Wax Paper Co.	6
Cadillac Motor Car Co.	7½
The Oasis Restaurant	5
Ray Day Piston Co.	1
A. J. Trumbull	1½
Parker Rust Proof Co.	1½
Federal Motor Truck Co.	2
Mr. Wolfe	1½
Russeks Clothing Store	10
The Detroit Edison Co.	10
Punch and Judy Theater	10
Lewis Bros. (undertakers)	3
Wilding Picture Productions, Inc.	3
Engass Jewelry Co.	1½
Avalon Theater (85-ton well job)	7½
J. S. Bache & Co., Penobscot Bldg.	1½
Stouffers Restaurant	20
6405 Woodward, gambling establishment (2-ton ice tank)	..
Metropole Hotel (two 500-lb. ice cabinets)	..
Total	**263**

For several years we have been endeavoring to show fan manufacturers and distributors the possibilities of volume ventilation of buildings and residences along our busy, noisy streets. My purpose in this was chiefly to enable occupants to close the windows and avoid street noises.

I note with considerable interest, therefore, your reference to an installation in a large building in your city for this specific purpose except that it was a complete air-conditioning job. My idea was only to introduce volume ventilation for residences and other buildings along these busy thoroughfares where widening of streets, the increase of traffic with resulting fumes, dust, and noise have impaired their value.

I believe there is a great field for the utility and for the fan and motor manufacturer, to say nothing of electrical contractors, in pushing this kind of application. I know from personal experience that it is a service well worthy of its cost.

There is another advantage from this volume of ventilation. It makes it possible to cool a residence after sundown in the evening. Several such test installations have been installed by us for comfort cooling, with satisfactory results.

I have one in my house to ventilate and cool the upstairs rooms which have become heated by exposure all day to the sun. My house happens to be well insulated and fairly well shaded by large trees, but there have been days when the temperature in my bedroom was as high as 93° F.

Usually, and without the fan, this temperature would prevail until after midnight, and approach close to the outdoor temperature at around 5 a. m. By operating the fan, however, I am able to drop the temperature almost as quickly as it drops outside, and during the hottest nights of the summer I have had sometimes during the night, to reach for a blanket.

This offers a possibility of comfort cooling at a very low first cost. So far this summer (through August) I have used 55 kwhr. Such a fan must be a real mover of air, and not one of your desk-type ventilating fans.

The one in my house moves 2,500 cu. ft. of air per minute. It is installed in the attic and is turned on usually at 8 or 9 in the evening. It draws outdoor air through the windows and into the bedrooms, and air is drawn through openings in the ceiling and into the attic.

The discharge goes into the attic itself, the air finding its way out through the attic windows or louvres or cracks in the shingles, or any way it can. The object in doing it this way is to cool off the bedroom ceilings and the attic floors and roof, because a great deal of the heat which reaches bedrooms is radiated from ceilings which have been heated up during the day.

We see a field for the utility in this type of comfort-cooling installation, to say nothing of the possibility it offers to volume ventilation, allowing you to close the windows on the street side of your house, if there is noise, and giving ample ventilation through openings on the quiet side.

The above fan installations are of course not conditioning units, because they do nothing to humidify or refrigerate, but they put some degree of comfort cooling within reach of the average pocket book.

We are also very much interested in the number of well-water type cooling jobs which have been put in, and are planned for installation in this territory. Several of these are in operation using water at a temperature of 52-55° F. The largest of these jobs has a 7½-hp. motor for circulating water.

One contractor tells us that he has contracts for 14 such installations. These of course do not give us the load a refrigerating job would, but it puts air conditioning within reach of a very much greater number of people and perhaps will provide volume for compensation.

Table 10 gives a list of the air-conditioning installations made in Detroit by the end of this summer.

TABLE 10—Total Installations In Detroit to Date

(Data furnished by S. S. Sanford, Detroit Edison Co.)

Class of Establishment	No. of Installations	Tons of Refrigeration
Offices	25	71
Office Buildings	2	680
Restaurants	16	300
Hotels	5	532
Residences	14	26
Department Stores	3	3,123
25¢ to $1.00 Stores	1	20
Furniture Stores	1	12
Candy Stores	4	13
Drug Stores	3	48
Jewelry Stores	4	18
Clothing Stores	3	17
Miscellaneous Stores	1	15
Electric Co. Sales Offices	2	24
Theaters	12	2,415
Banks	3	425
Brokers Rooms	1	40
Barber Shops and Beauty Parlors	2	30
Laboratories	2	43
Radio Station	1	1
Undertaking Parlors	3	9
Total	**108**	**7,862**

This list does not include ice, steam ejector, or well water installations.

MILWAUKEE

By G. W. Van Derzee, Milwaukee Electric Railway & Light Co.

We are sure that air conditioning is one of the important immediate future developments, and it is our intention to promote it with all the force and effect we can command.

Air conditioning has slightly different aspects in different parts of the country. In the South cooling effect is perhaps the main factor in considering an air-conditioning installation.

In the North cooling effect in many cases is important, but humidification and dehumidification are particularly to be considered, along with air washing and whatever cooling effect may be desired. In Wisconsin humidification through the relatively long heating season is an important factor in practically all contemplated installations.

In our deliberations on the most effective promotional effort for us to put into this activity in the past year or two, we speculated on the advantages of this company in actually merchandising and installing the various classes of air-conditioning equipment.

We concluded, however, that we could achieve broader and more effective results, and get more manufacturers and their agents to function in our territory, if we followed a more cooperative plan.

Accordingly, at the beginning of 1933 we engaged the services of an experienced, competent young air-conditioning engineer to work from our point of view with our power sales forces, but particularly to work with various manufacturers and their agencies as an investigator and consultant.

A particular function of his, also, is to look after the interests of the ultimate user of air-conditioning equipment.

Results so far this year indicate that this man is becoming a recognized factor in our territory in specifying suitable air-conditioning equipment, and in advising prospective customers from an unbiased point of view as to the results the various types of equipment and installations will give them.

TABLE 11—Installations in Milwaukee Prior to 1933

Class of Establishment	No. of Installations	Total Hp. Connected
Theaters	8	2,022
Office Buildings	2	556
Hotel	1	141
Court House	1	146
Bank	1	25
Stores	5	200
Total	**18**	**3,090**

Previous to 1933 our air-conditioning installations were chiefly in theaters, office buildings, and stores. Table 11 shows the number of installations and the connected horsepower in air-conditioning equipment of which we have a record.

Electric service for the foregoing installations is furnished generally under building contracts and it is somewhat difficult to obtain an actual measure of the revenue these installations produce. It appears fairly safe to estimate, however, that it is between $50,000 and $60,000.

There has been no new theater, office building, or large store construction or modernization in Milwaukee thus far in 1933 and no large air-conditioning installations, therefore, have been made. Efforts, however, have been concentrated on smaller installations in connection with which there probably is our greatest field for air-conditioning load building.

Table 12 shows some of the specific results which have been achieved in these various relatively small installations.

Several installations of various types of air-conditioning equipment have been installed in homes, but so far a definite record of the installations which have been made in this field is not available. Commercially there seems to be a particular interest in restaurants, funeral homes, and stores.

TABLE 12—Installations Made in Milwaukee in 1933

Class of Establishment	Total 1933 To July 31 No.	Hp.
Restaurant	3	94
Packing	1	26
Funeral Home	3	33
Private Office	2	5
Sausage Manufacturer	1	6
Tanner	1	103
Store	1	3
Broker's Room	1	7
Total	**13**	**277**

Estimated annual income from above installations made in seven months is something above $3,400.

NEW YORK CITY

By Joseph F. Becker
New York Edison Co.

A partial list has been prepared (see Table 13) of some of the air-conditioning installations in Manhattan and the Bronx prior to January, 1933, and also from January to July 31 of this year (see Table 14).

A comprehensive survey in this territory of air-conditioning installations has not been made recently, but is now under way. From the information available at present, however, this will give to some extent, a practical idea of what has taken place and what might be expected in the future.

An Outstanding Air-Conditioning System

The "largest air-conditioning system in the world"—involving more than $1,000,000 of work—is being installed in the broadcasting studios and lower floors of the new 70-story R.C.A. building in Rockefeller Center, New York, according to a contract awarded to the Carrier Engineering Corp.

In the new R.C.A. building, two batteries of centrifugal refrigerating machines will provide some 1,500 tons of refrigerating effect for summer cooling. One will take care of the National Broadcasting Co. studios from the third to the eleventh floors, the other will serve the basement, ground, and first floors.

Nearly 15 miles of duct work and more than 1,000 outlets and returns will be required for the distribution of the conditioned air. Under extreme hot weather conditions about 18,000,000 B.t.u. will be removed from the building every hour. This is equivalent to the hourly heat requirements for about 400 average sized homes during the winter season.

The moisture removed from the air

(*Continued on Page 10, Column 1*)

TABLE 13—Installations Made in Manhattan and the Bronx Prior to 1933

Type of Business	Number of Installations	Refrigeration Tonnage	Hp. Connected	Estimated Annual Revenue
Department and Retail Stores	10	265	440	$ 8,960
Hotels	4	735	1,200	22,710
Office Buildings and Offices	96	1,075	1,615	32,690
Residences	12	55	60	1,700
Restaurants and Cafeterias	22	515	620	15,550
Theaters	43	5,775	8,985	142,860
Miscellaneous	33	460	725	16,240
Total	**220**	**8,880**	**13,645**	**$240,710**

TABLE 14—Partial List of Installations Made in Manhattan And the Bronx From Jan. to July 31, 1933

Type of Business	Number of Installations	Refrigeration Tonnage	Hp. Connected	Estimated Annual Revenue
Department and Retail Stores	8	815	1,580	$ 32,170
Hotels	4	130	180	3,405
Office Buildings and Offices	171	705	930	18,825
Residences	35	50	50	1,400
Restaurants and Cafeterias	58	1,015	1,065	26,710
Theaters	3	1,015	1,640	26,075
Miscellaneous	30	180	210	4,705
Total	**309**	**4,000**	**5,655**	**$113,290**

UTILITIES REPORT ON AIR CONDITIONING

(*Continued from Page 9, Column 5*)

by the dehumidifiers in hot weather would make 700 gallons of water an hour. In the actual operation of the system, 300,000 gallons of water an hour are refrigerated.

The air-conditioning system will deliver approximately 400,000 cu. ft. of conditioned air a minute to maintain an average temperature of 70° F. in winter and a maximum of 85° F. in summer. Humidity is to be varied between 40 per cent in the winter and a maximum of 50 per cent in the summer.

While the system is almost entirely automatic, it will be under the constant supervision of one man, who will be located in the main fan room. Here will be a central control board which will indicate the functioning of all the apparatus and will provide for any mechanical adjustment that may become necessary.

The theatrical business has suffered from the slump, but as it has been expressed by a theatrical man "there is always a theater for a good play." It might be added, there are many theaters that could use air conditioning.

However, many of the legitimate playhouses close during the summer months and considering this and present financial conditions, much cannot be expected in air conditioning from this source. Of approximately 400 theaters in Manhattan and the Bronx, about 50 of the leading motion picture and vaudeville houses are air conditioned.

Following the air-conditioning installation on the main floor and basement of one of New York's leading department stores, several others have installed or have contemplated installing air conditioning. Installations have been made in some of the large establishments. These include Lord & Taylor, James McCreery, Bonwit Teller, and more recently in stores retailing women's apparel, such as Littmann's and Ohrbach's.

Restaurants and Cafeterias

Due to the importance of locating restaurants and cafeterias at various places in the city and considering the extensive rentals for the main floor space, several of the chains have located in renovated buildings.

In connection with extensive alterations involved, air-conditioning equipment has been installed. The Schraft stores, Longchamps, and others have air conditioned their restaurants.

Hotels

In anticipation of obtaining some of the business as a result of the "New Deal," hotel managements have made extensive alterations and have installed or will install air-conditioning equipment in the ballrooms, dining rooms, and tap rooms. This appears to be the logical step in partially insuring their guests comfort.

Residential

Considering residential buildings, air-conditioning equipment and prices together with present incomes, the market for this year at least may be divided as follows:

1—Those who can well afford complete air conditioning but who seldom occupy their city residence for any length of time.

2—Those that must remain in the city but due to present circumstances can afford but a limited expenditure.

3—People renting apartments in a position to afford some phase of air conditioning at a nominal cost.

In these groups with the exception of the first, quite a few installations have resulted; it is expected many others will follow.

Relation of Utilities to Air-Conditioning Development

The utilities are in a strategic position to promote the general use of air conditioning and progress made will be beneficial both to the public and to themselves. This may be accomplished by educational efforts in their advertising similar to that contributed by the manufacturers of air-conditioning equipment; also by cooperating in a technical capacity with architects, engineers, contractors, and builders who are promoting large installations.

In keeping with the policy of our companies, no actual sale of equipment will be made; however, sales promotional activities in support of the manufacturers sales organization will be extended.

This will possibly include showroom space in our district office buildings for the display and demonstration of the newest developments together with the study of consumers' requirements, affording them the services of our air-conditioning system specialists and other company representatives.

SAN FRANCISCO

By R. E. Fisher and J. W. Wrenn
Pacific Gas & Electric Co.

In the fall of 1932, the Pacific Gas & Electric Co. determined to do something in a promotional way toward increasing the amount of air conditioning on its system.

The various local representatives of eastern factories were consulted as to what was required and a comprehensive plan of promotional activities was laid out.

Later it was ascertained that these manufacturers were not in a position to follow leads, particularly on the smaller installations, such as homes, offices, etc. Their method of operation had been practically confined to work with architects and builders with sales through general contractors, but without a set-up sufficient for quickly following up prospects in outside territories.

A rough survey of the territory showed that including the complete and partial systems on which reports were obtainable, there was connected to company lines at the end of 1932 the load shown in Table 15.

TABLE 15—Air-Conditioning Load Connected to Lines of Pacific Gas & Electric Co. at End of 1932

Business	No. of Installations	Hp.
Banks	18	120
Buildings, Office	25	285
Buildings, Public	17	286
Bakeries	17	51
Cafes and Restaurants	16	69
Churches	3	10
Clubs	3	38
Department Stores	10	281
Dairies	1	10
Funeral Parlors	1	1
Fur Stores	1	5
Fruit (Wholesale)	4	45
Hotels	10	80
Hospitals	6	63
Industries	10	446
Lodges	3	29
Millinery Stores	1	16
Milk Depots	14	164
Markets	1	2
Museums	1	5
Offices	5	22
Pool Rooms	1	5
Prisons	1	15
Railway Depots	1	20
Stores	2	12
Schools	5	15
Theaters	28	1,205
Miscellaneous	7	24
Total	**212**	**3,324**

This survey did not include air filters separately installed in the bay region where the temperature and humidity the year round is such that up to the present time complete air conditioning has not been considered necessary by owners and builders.

As the survey was a general one it is probable that at this time, including the power used for ventilation in connection with air filters, there is upward of 6,000 hp. in use on company lines.

The revenue from these installations was variously estimated at from $10.40 to $24.65 per hp. and it was finally determined to use an average of $18 per hp. for the 1933 installations.

After considerable negotiation it was decided that the company would sell small apparatus and arrangements were made with a manufacturer who was able to, and who agreed to service all installations made in the entire territory.

Arrangements were then made with an ice company and some of the larger manufacturers, to make complete installations of such apparatus as was required on the larger jobs.

It was determined to confine the company's sales efforts for this season to the hot interior valleys. Five salesmen who were also engineers and who had experience in selling heating installations were picked by the various divisions and a sales school was held, to which all division sales managers, the five salesmen, and several others interested, attended.

The results of this year's sales efforts by the company have not been large, but a great number of highly interested prospects have been developed, the majority of which will probably be closed during the coming year. The existing financial situation has prevented many from purchasing this year.

The results of the company's endeavors this season have been the following sales: 2 restaurants, 2 funeral parlors, 2 residences, 1 fur store, 1 clothing store, and 1 office.

Sales by other agencies consist of a varied assortment of hotels, clubs, dairy delivery depots, hospitals, stage stations, lunch rooms, etc.

Prospects which have been developed, and which will probably be closed in 1934 are as follows: 1 apartment house, 2 barber shops, 4 beauty parlors, 5 banks, 1 clinic, 1 candy store, 1 dentist, 2 dry goods stores, 4 dress shops, 2 fur stores, 8 funeral parlors, 3 hotels, 1 hat store, 1 market, 3 offices, 1 optician, 5 physicians' offices, 21 residences, 10 restaurants, 2 shoe stores, 2 soft drink parlors, 1 wholesale drugs.

Endeavor was made to diversify prospects as much as possible as it was found that a single installation in any line of business made it a great deal easier to interest others in the same line.

For instance, with the successful installations made this year in two restaurants and two funeral parlors, prospects in these two lines have all stated that they would make similar installations during the coming year.

Future Developments

This territory in a large part is served with natural gas, and developments in hot-air heating furnaces that will give heat and humidity in winter and cooling in summer are already under way.

Sales of cooling and filtering apparatus to be attached to the many thousands of hot air furnaces now in use, represent a large field.

Precooling of fruit before sending it to packing houses, and air conditioning it after it reaches there is a business in itself.

The great storage rooms of the fruit and vegetable canneries can be air conditioned to save the pack and prevent loss from rusted and swelled cans.

Reconditioning and improving present unsatisfactory installations. Increasing present partial systems.

The air conditioning of perishable cargo for the shipping industry is a possibility that has a future.

PHILADELPHIA

By George E. Whitwell
Philadelphia Electric Co.

Our records show an average revenue of $19.50 per horsepower year* for all types of installations as against your assumption of $22. per horsepower year. Eighty-five per cent of your load prior to 1933 was commercial and 94 per cent of the load added this year is of the same character; all of this was credited at $22 per horsepower year.

TABLE 16—Installations in Philadelphia on Aug. 1, 1933

Classification	No. of Installations	Connected Hp.
Textiles	12	696
Tobacco	8	937
Candy	6	920
Food Products	11	377
Printing	2	68
Miscellaneous Industries	6	289
Theaters	23	4,350
Office Bldgs & Offices	16	2,550
Retail Stores	12	440
Banks	4	260
Radio Studio	1	75
Department Stores	2	1,768
Restaurants	10	570
Board Rooms	4	17
Broker's Offices	5	37
Clubs	1	3
Funeral Home	1	7
Residences	50	..
Dancing Academies and Auditoriums	1	40
Miscellaneous Commercial	6	730
Totals	**181**	**14,134**

Seventy-eight per cent of our load is commercial and has a revenue of approximately $13 per horsepower year, while 22 per cent is industrial and has a revenue of approximately $42.50 per year.

Our reports show 14,134 hp. installed and $276,175 per year revenue as of Aug. 1, 1933. Correcting our figures, on the basis of your revenue assumptions, we would have 16,920 hp. connected and a revenue of $424,499 per year.

TABLE 17—Installations Made in Philadelphia from Jan. 1 To Aug. 1, 1933

Classification	No. of Installations	Connected Load In Hp.
Leather	1	160
Textile	1	2
Candy	1	3
Funeral Home	1	7
Country Club	1	3
Retail Stores	4	47
Private Offices	5	64
Brokers' Offices	5	37
Restaurants	1	15
Total	**20**	**338**

*This $22 referred to was an estimate used by Commonwealth Edison Co., and is apparently too high. Actual meter readings are now being obtained.

Table 16 gives installations of air-conditioning equipment in Philadelphia, on Aug. 1, 1933.

Table 17 shows the air-conditioning installations made in Philadelphia during the period Jan. 1, to Aug. 1, 1933.

NORTHERN ILLINOIS

By E. W. Atkison, Public Service Co. of Northern Illinois

Our air-conditioning promotional activity has extended over 1932 and 1933. It includes direct selling of small unit-type equipment, as well as cooperative promotional activity with the various manufacturers and dealers.

Our decision to do direct selling in the field of unit-type applications was influenced by the following factors:

1. It is expected that the selling effort of manufacturers and dealers will, for the next few years, be concentrated in the commercial sections of the larger metropolitan cities. There is as yet little or no sales activity on the part of dealers in the suburban towns.
2. The greatest part of the potential air-conditioning business in our territory is comprised of small stores, small buildings, small theaters, and residences. The unit-type of equipment was specifically designed for this type of application and this equipment can be sold with a minimum of complications, due to its simplicity.
3. Our gas-house heating division offered an effective channel through which an air-conditioning sales plan could be made effective. These men had the proper engineering background, had sold heating or were making contacts with the best prospects for air conditioning, and finally air-conditioning sales rounded out the sales activity of this division by being a seasonal complement of the heating sales activity.

During 1932, we engaged in a very limited activity. The air-conditioning division consisted of a full time air-conditioning engineer, and three men who were temporarily transferred from the gas-house heating division to air-conditioning sales division during three of the summer months.

TABLE 18—Installations in Territory of Public Service Co. of Northern Illinois on Sept. 1, 1933

Class of Establishment	No. of Installations Prior to Jan. 1, 1933	No. of Installations In 1933	No. of Installations Total	Hp. Connected Prior to Jan. 1, 1933	Hp. Connected In 1933	Hp. Connected Total	Estimated Annual Revenue Jan. 1, 1933	Estimated Annual Revenue In 1933	Estimated Annual Revenue Total
Hotels	..	..	..	..	..	..	..	..	..
Offices	1	..	1	5	..	5	$ 125	..	$ 125
Restaurants	4	1	5	83	16	99	2,100	$ 400	2,500
Residences	3	12	15	40	30½	70.5	1,000	775	1,775
Stores, Retail	2	6	8	125	52	177	3,125	1,300	4,425
Theaters	8	4	12	1,294	265	1,559	32,350	6,625	38,975
Funeral Homes	..	1	1	..	3	3	..	100	100
Miscellaneous	..	..	..	..	..	..	..	..	..
Industrial	5	1	6	1,391	83	1,474	34,800	2,100	36,900
Totals	**23**	**25**	**48**	**2,938**	**449½**	**3,387.5**	**$73,500**	**$11,300**	**$84,800**

During 1932, only one make of equipment was sold; namely, Frigidaire air-conditioning units. Salesmen were on a straight salary basis and all leads developed by these men which offered possibilities for the installation of large central-type air-conditioning systems were turned over to local dealers for direct sales effort. A limited amount of direct-by-mail and newspaper advertising was used.

During 1933, the air-conditioning promotional activity was considerably expanded. This activity has included:

1. The preparation of a special air-conditioning sales training course which extended over a five-day period and was attended by all gas-house heating salesmen, sales supervisors, and district sales managers.
2. A dealer franchise was obtained from the Carrier Engineering Corp. for their unit-type air-conditioning equipment, so that we handle two makes.
3. Demonstration cottages were built and installed on the sales floor at our Evanston and Oak Park stores and a demonstration air-conditioning unit was installed in the model apartment in our Joliet store.
4. Sample equipment was obtained from each manufacturer to provide complete store displays at Evanston, Oak Park, and Joliet. Three special window displays were also prepared and used at these three locations.
5. Two newspaper advertisements were used in the local newspapers in selected communities.
6. Individually typed letters were sent to a carefully selected group of prospects. Twenty thousand semi-formal invitations were sent to home owners, inviting them to inspect the demonstration cottages in our stores. No other direct-by-mail advertising was used.
7. A schedule of installed prices was worked out for standard combination installations. This arrangement made it possible, in most cases, for the salesman to make a price quotation at the first interview.
8. A salesman's commission schedule was prepared which provided an 8 per cent commission on the list price of equipment sold. In addition, the salesmen were paid commissions on equipment installed by approved dealers and contractors, if the salesmen had made a direct contribution to these sales.

Due to the launching of the aggressive gas-house heating sales campaign in the Chicago area on July 19, all direct selling activity of air conditioning was discontinued by the Public Service Co. shortly after this date.

Prior to 1933, there were 23 air-conditioning installations in our territory (see Table 18), having a total connected load of 2,938 hp. and a gross annual revenue of $73,500. This estimated revenue is based on $25 per hp., which is probably conservative, as a large percentage of the connected load was represented by theaters which require refrigeration over an exceptionally extended period during the summer.

During 1933 to date, 25 additional installations have been made in our territory. These installations require a connected load of 449½ hp. and provide an estimated annual revenue of $11,300.

It is interesting to note that the average connected power load on the 23 installations connected prior to 1933 was 128 hp. while the average connected load on the installations made this year was 18 hp.

One-half of the installations prior to 1933 were in larger theaters and for industrial applications. Although the number of theater installations was increased from 8 to 12 during 1933, the new theaters were smaller and the unit tonnage of refrigeration was considerably less than for the older installations.

All of the remaining installations sold this year in our territory were of the small unit-type equipment. Twelve of these were in residences and average 2.5 hp. per residence.

LOS ANGELES

By H. H. Douglas
Southern California Edison Co., Ltd.

The larger portion of the air-conditioning activity which has taken place on our lines recently has been in the citrus packing industry. We have connected a little over 600 hp. since the first of the year and practically all of it has been for industrial purposes, such as to correct temperature conditions and humidity for proper storage of citrus fruits.

We have just recently put two men in the field to develop cooling by means of the Ilg attic ventilating plants. These two men are now going to work on direct sales and while it is an experiment, we are expecting some fairly good results.

We have devoted some attention to the matter of developing the sale of Frigidaire equipment through the medium of our regular trade channels, for small room coolers. Some of these installations have been made quite recently and are giving fairly good satisfaction. This also promises to be a very good activity next year.

Practically all the air conditioning we have here in southern California is either for industrial applications, as described above, or for cooling of theaters or auditoriums.

Several of the large theaters have quite recently put in refrigeration equipment for chilling the water on air-washer systems in order to correct high humidity conditions, and the trend at the present time indicates that any new theater construction will be provided with the means of chilling the cooling water.

It is rather difficult to promote air conditioning in the Los Angeles territory due to the fact that we never have any very hot weather, and even on jobs where you would expect it to be easily sold it is somewhat difficult due to the fact that people who live in warmer portions of southern California, and who can afford to go to the beaches and mountains in the summer, usually spend their time there and do not seem to pay much attention to whether their houses are as comfortable as they perhaps could be with cooling equipment.

We have one restaurant cooling installation in San Joaquin Valley that has been in operation for 10 years, and even though this party does a tremendous business in warm weather, we have not so far, been able to sell any of the other restaurants.

All new hotels which are built in the hot sections are, of course, going up with air-cooling equipment, but where it is hot enough to justify this equipment it is also dry enough to make it possible to get good results with air washers, so they usually install an air washer and call it a good air-cooled job.

Following is a report from our in-

(*Continued on Page 12, Column 1*)

PATENTS

ISSUED DEC. 12, 1933

1,938,588. HEAT EXCHANGER. Charles C. Hansen, South Orange, N. J., assignor, by mesne assignments, to The Chase Companies, Inc., Waterbury, Conn., a corporation of Connecticut. Application April 11, 1931. Serial No. 529,335. 10 Claims. (Cl. 257—124.)

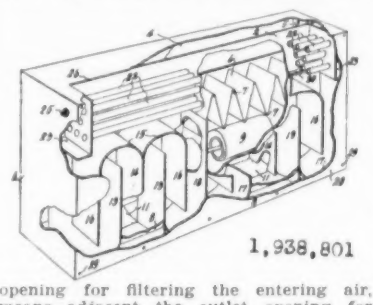
2. A heat exchanger construction, comprising, in combination, a tube for the reception of a fluid or other heat exchange medium having screw threads thereon, and a radiator fin formed entirely of sheet metal and having a tubular screw threaded boss and constructed to be applied to the tube by threading the boss on the tube and to be held in position on the tube by the contact of the boss with the tube.

1,938,589. HEAT EXCHANGER. Charles C. Hansen, South Orange, N. J., assignor, by mesne assignments, to The Chase Companies, Inc., Waterbury, Conn., a corporation of Connecticut. Application April 22, 1931. Serial No. 531,942. 5 Claims. (Cl. 257—224.)

1. A heat exchanger having in combination a casing for the circulation of a fluid, having an opening at each end thereof, an inner element for the circulation of a fluid of a different temperature suspended within the casing, and having a series of coils, a fitting at each end of the casing for suspending the inner element within the casing, each fitting having a tubular portion secured to the margin of the casing about one of said openings and a second tubular portion extending through said first tubular portion into the casing and having its wall rigidly attached to the wall of said first portion, and a connection between the second tubular portion of each fitting and the inner element to suspend the inner element within the casing.

1,938,801. VENTILATING AND AIR CONDITIONING DEVICE. Roland B. Bourne and Hiram H. Maxim, Hartford, Conn., assignors to The Maxim Silencer Co., Hartford, Conn., a corporation of Connecticut. Application July 21, 1931. Serial No. 552,174. 6 Claims. (Cl. 98—39.)

1. A ventilator and air conditioning unit which comprises a casing having inlet and outlet openings, means adjacent the inlet



1,938,801

opening for filtering the entering air, means adjacent the outlet opening for controlling the temperature of the air as it leaves the casing, a plurality of tortuous sound attenuating passages positioned in the airway intermediate the air filtering means and the air temperature controlling means and air moving means positioned in the casing to draw air through the air filtering means and discharge it into the sound attenuating passages.

1,938,858. THERMAL RELAY FOR REFRIGERATING MECHANISMS. Edwin M. Post, Jr., New York, and George O. Hanshew, Forest Hills, N. Y., assignors to International Motor Co., New York, N. Y., a corporation of Delaware. Application Aug. 13, 1932. Serial No. 628,658. 3 Claims. (Cl. 200—138.)

1. In a device of the class described, a heat responsive element, a spindle about which said heat responsive element is coiled and with which it is operatively engaged at one end, electrical contacting means mounted on the spindle at the other end, heat insulating means embodied in said spindle intermediate its ends, and a boot enclosing the first named end of the spindle to prevent the flow of air to the second named end of the spindle.

1,938,880. ICE CREAM METHOD AND MACHINE. George Hall White, Washington, D. C. Application June 11, 1929. Serial No. 370,000. 11 Claims. (Cl. 62—174.)

1. A method of continuously manufacturing ice cream from the mix, consisting in continuously and progressively subjecting the mix to the action of a refrigerant, thereafter treating the refrigerated product to increase the "yield" thereof, and interrupting such "yield" treatment when the product has reached any selected predetermined "yield" condition.

1,938,925. INSULATING UNIT. Virginius W. Moody, Long Branch, N. J., assignor to Reynolds Research Corp., New York, N. Y., a corporation of Delaware. Application May 5, 1932. Serial No. 609,343. 3 Claims. (Cl. 62—91.5.)

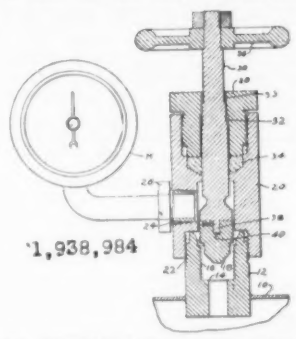
1. An insulating unit comprising a refrigerant storage compartment, a chamber within said compartment and containing a refrigerating substance for cooling said compartment, a second storage compartment, there being a dead air space between said compartments, and means for adjusting the space relationship of the opposed walls of said compartments in said air space.

1,938,983. REFRIGERATOR ICE RACK CONSTRUCTION. Russell T. Smith, Greenville, Mich., assignor to Gibson Refrigerator Co., Greenville, Mich., a corporation of Michigan. Application Dec. 15, 1930. Serial No. 502,334. 1 Claim. (Cl. 62—31.)

In an ice refrigerator construction, the combination of a shelf and an ice rack disposed above said shelf, the rack including a plurality of relatively thin upstanding sheet metal portions, directly upon the upper edges of which a block of ice is adapted to rest, and trough-like plate connecting the tops of the sheet metal members but arranged below their highest portions and serving to rigidify the rack, to assist in supporting the ice block and to receive and conducting away the water formed by the melting thereof, whereby the spaces between the sheet metal members form passages open to the block of ice through which air may flow into contact with the under surface of the latter, and whereby the weight of the ice and the heat conductivity of the sheet metal supports tend to cause the latter to melt into the ice cake and thereby increase the ease with which they can conduct heat thereinto.

1,938,984. VALVE CONSTRUCTION. Russell T. Smith, Greenville, Mich., assignor to Gibson Refrigerator Co., Greenville, Mich., a corporation of Michigan. Application Dec. 11, 1931. Serial No. 580,362. 4 Claims. (Cl. 251—44.)

1. In combination with a system part having a hollow nipple integrally secured to a wall thereof and a rotatable and



1,938,984

axially movable plug in said nipple for sealing the latter, a hollow body removably but sealingly secured to said nipple, a shank mounted in said body for axial movement, a handle on one end of said shank, and a blade on the other end for engaging and cooperating with a slotted part of said plug to move the latter axially in the nipple, a wall of the body being provided with an orifice communicating with the interior thereof and therethru, with the nipple, the interior of the body, when it is on the nipple, being closed and sealed thereto at all places except at said orifice, and resilient means carried by the plug adjacent the slot to create a friction grip between the blade and the plug.

1,938,985. REFRIGERATOR DISPLAY COUNTER. Raymond H. Starr, North Kansas City, Mo. Application June 6, 1931. Serial No. 542,511. 3 Claims. Cl. 62—37.)

1. The method of refrigerating perishables, including constantly moving portions of a perishable product into and out of a refrigerating zone for alternately cooling and displaying the product.

1,939,109. QUICK FREEZING OF FOOD PRODUCTS. Clarence M. Davidson, Miami, Fla., assignor to Pan American Frozen Products, Inc., Miami, Fla., a corporation of Delaware. Application May 22, 1930. Serial No. 454,601. 10 Claims. (Cl. 62—104.)

1. In combination, a reservoir, glycerin therein utilized as a refrigerant and a lubricant, permanent containers engaging said lubricant and refrigerant, and means in the reservoir for supporting the containers as they are moved adapted to be lubricated by the glycerin while the contents of the containers are refrigerated by the glycerin.

1,939,179. METHOD AND APPARATUS FOR COOLING AND CONDITIONING AIR IN RAILWAY CARS. William J. Madden, Lansdowne, Pa. Application April 3, 1931. Serial No. 527,404. 5 Claims. (Cl. 62—24.)

1. In combination with a railway passenger car, an air cooling unit comprising a truck adapted to be positioned alongside the car adjacent a side window thereof, a refrigerated chamber on said truck, a portable duct leading from said refrigerated chamber to said side window of the car, a blower for introducing cooled air from said refrigerated chamber through said duct into the car, and means whereby air is simultaneously exhausted from another window of the car remote from the window through which the cooled air is initially introduced.

1,939,292. CHLORINATION OF METHYL CHLORIDE. Paul Johnson Carlisle, Niagara Falls, N. Y., assignor, by mesne assignments, to E. I. du Pont de Nemours & Co., a corporation of Delaware. No Drawing. Application Oct. 11, 1927. Serial No. 225,603. 9 Claims. (Cl. 260—166.)

8. Process for the manufacture of methylene chloride and chloroform comprising subjecting a mixture consisting of methyl chloride and chlorine to a reactive temperature, said mixture containing an excess of methyl chloride.

1,939,334. REFRIGERATING DEVICE. Francis X. Burke, New York, N. Y. Application July 15, 1930. Serial No. 468,119. Renewed Jan. 26, 1933. 7 Claims. (Cl. 62—104.)

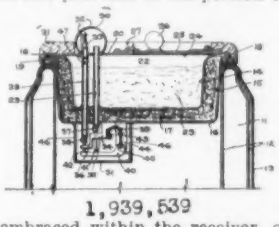
2. A receptacle for articles to be refrigerated, comprising a lower section for supporting the article therein, an upper section for holding said article in place in said lower section, and a resilient member detachably connected to said lower section and adapted to be engaged with said upper section to press said sections into contact with said article.

1,939,445. FREEZING TRAY FOR REFRIGERATORS. George Calvin Henne, Herrin, Ill., assignor to Inland Mfg. Co., Dayton, Ohio, a corporation of Delaware. Application Sept. 30, 1930. Serial No. 485,495. 13 Claims. (Cl. 62—108.5.)

8. A freezing tray comprising; an inverted T-shaped holder; and a one piece flexible non-metallic container divided in compartments having adjacent walls joined by a fold at their upper edges, said fold overhanging the upper edge of the stem of said T-shaped holder.

1,939,539. TEMPERATURE REGULATOR. Allen A. Canton, New York, N. Y. Application Oct. 1, 1931. Serial No. 566,254. 3 Claims. (Cl. 62—91.5.)

1. In a mechanism of the character described, a receiver for a supply of dry-ice, a tube extending through said receiver, and a pair of valves respectively adapted to seal the opposite ends of said tube, the bore of said tube being in communication with the interior of said receiver through an aperture provided in the portion of said



1,939,539

tube embraced within the receiver, one of said valves being operative to permit the escape of the refrigerant gas in one direction when the pressure within the receiver exceeds a predetermined limit and the other of said valves being operative to permit the escape of said gas in the opposite direction when the temperature of the zone surrounding said valve rises above a predetermined limit.

1,939,551. WATER COOLER. Louis W. Hassendon, Toledo, Ohio. Application Jan. 30, 1933. Serial No. 654,354. 10 Claims. (Cl. 62—91.5.)

1. A water cooler comprising a chamber having a door, a perforated jacket in the chamber adapted to contain a solid refrigerant and removable through the door, a water tank loosely surrounding the jacket and having an open side registering with the door, means for supporting a water bottle on the chamber in communication with the tank, and valvular means carried by the chamber adapted to direct cold gas from the interior of the tank to the exterior thereof.

CLASSIFIED

PAYMENT in advance is required for advertising in this column.

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

REPLIES to advertisements with box numbers should be addressed to the box number in care of Electric Refrigeration News, 550 Maccabees Bldg., Detroit, Mich.

INDEPENDENT SERVICE COMPANIES

HALECTRIC Thermostat repair service, Ranco, B & B, Two dollars each, one year guarantee, prompt service. Halectric Laboratory. 1793 Lakeview Road, Cleveland, Ohio.

FRANCHISE WANTED

WANTED representation of a household refrigerator for Austria by leading firm in the business which already has workshops, display rooms and complete organization. Box 606.

INSTALLATIONS IN 3 CITIES SUMMARIZED

(Concluded from Page 10, Column 5)

dustrial heating engineer, which treats the industrial features quite thoroughly.

Citrus Packing Industry

This is the most fertile field for industrial air conditioning in southern California. The desire of packers to hold fruit in storage awaiting favorable market conditions has stimulated various methods of improving the keeping qualities of the fruit.

Several patented waxing processes are now used and recently the proper air conditions for storage have been thoroughly established. It seems probable that a combination of waxing with proper air conditioning will permit the fruit to be held in storage for as long as necessary to meet any seasonal market condition and thereby stabilize prices.

It should be noted that the air conditioning required is not in any sense refrigerated "cold storage." Such cold storage schemes were tried and found unsuitable. Proper humidity, air motion, and ventilation are the prime factors. Refrigeration is a valuable adjunct but temperatures below 55° F. are seldom used. Table 19 shows the growth of this load.

TABLE 19—Citrus Air-Conditioning Installations

	Prior to Jan. 1,1933	Jan. 1 to Aug. 15, 1933	Total
Number of Installations	2	10	12
Horsepower Ventilation	40	217	257
Horsepower Refrigeration	210	500	750
Horsepower Total	250	717	967
Approximate Revenue	$7,500	$21,500	$29,000

Motion Picture Studios

This is probably as large a field for air conditioning as the citrus industry, although strangely enough not as much progress has been accomplished. Air conditioning is used primarily for holding proper temperature and humidity in the film processing laboratories, although some studios are now using it for conditioning their sound stages for comfort.

The largest installation, that of the Fox Film Corp., is located in the City of Los Angeles and is therefore served directly by the municipal system and of course indirectly by the Southern California Edison Co. This is a complete sound stage and laboratory air-conditioning system. The equipment was installed by Carrier in 1929. A total load of 750 hp. is required.

A second installation was made in 1931 by Carrier for the Metro-Goldwyn-Mayer studios in Culver City, Calif. This is for conditioning the film processing laboratories only and requires 250 hp., about 150 of which is represented in the refrigerating machine.

Smaller laboratories are using some equipment, mostly as washers, amounting to about 100 hp. more.

Candy Manufacturing

The John O. Gilbert Chocolate Co. pioneered air conditioning in their candy plant at Vernon, Calif. They are using a Carrier spray washer system with a 40-hp. refrigerating machine and about 20 hp. in fans and circulating pumps. This equipment was installed in 1930 and has proved very successful. The keeping qualities and salability have been considerably improved and the equipment has paid for itself several times.

Manufacture of Surgical Ligatures

Sharpe and Davis of Beverly Hills, Calif., are using two American air washers to hold proper humidity and temperature in their laboratory where they prepare surgical ligatures. The equipment requires about 10 hp.

standardized equipment in buildings already in existence and the industry is, therefore, no longer dependent on new construction to obtain its volume.

As an example of this, it was found practical to install an air-conditioning system aggregating 140 tons of refrigeration in a women's apparel store which had been completely redecorated during the winter of 1932/1933. The decision to add air conditioning was not reached until early in May.

On May 20, the contract was signed and the installation started. By careful planning, it was made possible to install 15 standardized units in this store without interfering in the slightest degree, with the operation of the business or without, in any way, defacing or injuring the fine wood panelling and decorations which had been placed in the store during the previous winter.

The installation was completed in 30 days and operation began on June 21. During July and August, the increase in the volume of the retail business was such as to be considered phenomenal by the owners and exceeded the predictions made by our air-conditioning engineers.

As a contrast to this installation, a small shoe repair shop might be mentioned. Two 1½-hp. compressors were installed with two cooling units. A considerable volume of business was attracted. Between these extremes, there are a number of smaller shops including two retail shoe stores, the basement of a dollar store, and two restaurants of a national chain whose checks do not average over 35 cents.

The owner of a grocery store who installed summer air-conditioning equipment last fall, found that he did more business in July, 1933, than in December, 1932, whereas previous to the installation of this equipment, July was the dullest month so far as sales volume was concerned.

Large installations are, of course, important to us from a revenue standpoint, but the success of the air-conditioning industry as a load builder will depend to a great extent on a large number of small installations and the past season has, in our opinion, conclusively demonstrated that we are on the road to this achievement.

The promise of last year as to the use of summer air conditioning in residences has been fulfilled to the extent that the residential users form the largest single group in the sales made this year in St. Louis.

We installed metering devices indicating the number of hours of operation and the kwhr. consumption on five residential jobs. These had been in operation for some time and the owners, therefore, had reached a normal operating method.

We felt that it would not give a true picture to make more tests at this time because in the beginning some users are apt to operate the equipment more than is necessary, and in other cases they use it very sparingly until they realize the benefits which they obtain.

The period covered by these records included a considerable amount of cool weather, particularly cool nights such as are encountered at various times in St. Louis. It was not an extremely hot period. We, therefore, feel that the results obtained from these five installations are representative.

These five installations aggregated 11.5 hp. The accumulated operating time was 1,705 hours in 214 days. The total kwhr. consumption was 3,074. This shows an average usage of almost eight hours per day.

Previous studies have established the fact that in St. Louis there are 120 days during the season when cooling is required. On the basis of eight hours per day usage, this would indicate somewhat less than 1,000 hours' use of the equipment during a season.

The average kw. connected load per installation was 1.575 resulting in a usage of 1.14 kwhr. per kw. per hour of operation, or a total seasonal consumption of 1,090 kwhr. per kw. connected load. A residential usage of this magnitude certainly justifies intense promotional efforts to popularize air conditioning.

The office building of the International Shoe Co. is air conditioned throughout. This building consists of 10 floors and a basement cafeteria and is used largely as general office space with some private offices on the various floors. The total floor area is approximately 125,000 sq. ft. and the cubical content 1,578,125 cu. ft.

The equipment for accomplishing air conditioning consists of a 250-hp. Carrier centrifugal compressor for refrigeration, an air washer, tempering and heating coils at the washer, a 20-hp. fresh air fan, filters for cleaning the fresh air, 10 recirculating fans (one on each floor), heating coils in the fan chamber on each floor, and the necessary temperature controls operated by compressed air.

During the heating season outside air is drawn into the basement fan through filters, is tempered, and then passes through the washer where it is brought up to the desired wet bulb temperature and is reheated and forced up the main duct or shaft to the various floors.

This heated and humidified air passes into the fan chamber on each floor and is mixed with return air from this floor. The recirculating fan draws richly conditioned air from the main shaft, mixes it with recirculated air and forces this mixture through heating coils where it is brought up to the desired temperature and delivered to the conditioned space through overhead ducts. These ducts are equipped with diffusers so that the air is spread as it is delivered downward.

During the cooling season outside air is drawn into the basement fan through filters and is forced through the air washer which is provided with cold water by the refrigerating plant. This air is cooled and saturated at the desired wet bulb temperature and is then delivered up the shaft to the various floors and is mixed with the return air from the floor at the recirculating fan.

This mixture of cool dehumidified air and return air is then delivered through the overhead ducts to the conditioned area. Thus the methods of handling the air for heating and for cooling are practically the same.

During the year 1932, refrigeration was used on this system for 1,253 hours and the kwhr. consumption for refrigeration was 171,990, or 0.732 kwhr. per kw. connected per hour. The total all year around kwhr. consumption, including the operation of the fan, summer and winter, was 270,989 kwhr.

These results are in response to a continued promotional program started last year. The principal feature of this program has been a central exhibit in the company building displaying and demonstrating all makes of equipment represented by distributors in St. Louis. This exhibit has been promoted through direct mail and general publicity.

In addition, a special exhibit was arranged at a prominent hotel where the leading city and service clubs meet regularly. Talks on air conditioning were given before these organizations and at the conclusion of these meetings, they were invited to visit special suites in the hotel in which the equipment was installed and in operation.

Our air-conditioning staff directed these activities and cooperated with the air-conditioning distributors in contacting and developing prospects and closing sales. The sales policy of our air-conditioning department is to sell the idea of air conditioning to the prospect to the point where the manufacturers and distributors can step in and definitely present the advantages of their particular equipment to close the sale.

TABLE 21—Installations Made in St. Louis, Jan. 1 to Aug. 1, 1933

Class of Customer	No. of Installations	Kw. Connected	Estimated Kwhr. Per Year
Bakery	1	16½	17,000
Broker's Board Rooms	1	40	32,040
Hotel Coffee Shops	2	60	56,200
Industrial	3	84	118,200
Offices	18	49½	50,250
Residences	29	54	54,000
Retail Stores	5	249¼	304,600
Sales Rooms	3	6½	6,000
Shoe Repair Shop	1	2½	2,000
Theaters	1	15	22,500
Totals	**64**	**577¼**	**662,790**

TABLE 20—Industrial Air Conditioning on Lines of Southern California Edison Co., Inc.

Industry	Prior to Jan. 1, 1933 No.	Prior to Jan. 1, 1933 Hp.	Jan. 1, to Aug. 15, 1933 No.	Jan. 1, to Aug. 15, 1933 Hp.	Total No.	Total Hp.	Annual Revenue
Citrus Packing	2	250	10	717	12	967	$29,000
Motion Picture Studios	4	350	..	..	4	350	10,500
Candy Manufacturing	1	60	..	..	1	60	2,000
Surgical Supplies	..	..	1	10	1	10	350
Totals	**7**	**660**	**11**	**727**	**18**	**1,387**	**$41,850**

ST. LOUIS

By C. E. Michel

Union Electric Light & Power Co.

Air conditioning has been sold to the St. Louis public. This statement is proved by the fact that the public has bought air-conditioning equipment in a steadily increasing volume. In 1933 up to Aug. 15, the number of installations sold on our lines was 50 per cent more than during the year 1932 and the kw. connected load showed a corresponding increase of almost 100 per cent.

The outstanding feature of the past year is the wide divergence in usage of air conditioning. This was brought about by the development and adaptation of standardized units to all types of establishments. The trend of the industry is toward the installation of

TABLE 22—Installations in St. Louis Prior to Jan. 1, 1933

Class of Customer	No. of Installations	Kw. Connected	Estimated Kwhr. Per Year
Bakeries	6	30.35	91,050
Broker's Board Room	1	32.00	28,800
Hotel Dining Rooms and Coffee Shops	8	488.13	401,300
Industrial Process Installations	5	669.60	1,107,050
Office Buildings (Complete)	1	300.00	280,000
Offices	19	76.53	55,000
Residences	24	43.25	43,250
Restaurants	5	274.00	362,500
Retail Stores	8	252.50	433,480
Sales and Display Rooms	6	61.00	47,600
Theaters	7	2,654.25	2,491,400
Undertaker	1	16.00	6,200
Totals	**91**	**4,897.61**	**5,347,630**

CINCINNATI

By H. C. Blackwell

The Union Bas & Electric Co.

Table 23 gives a list of air-conditioning installations in Cincinnati. It will be noted that this covers manufacturers of complete air-conditioning equipment, ammonia compressors, and the ice company. There are at the present time three ice-cooling installations now in service. Others are of the electric refrigeration type.

Table 24 shows the hp. in air conditioning installed prior to 1933, and Table 25 shows the hp. in air conditioning installed during 1933. This may be summarized as follows:

	Installations	Hp.
Installed Prior to 1933	44	3,681
Installed During 1933	30	482.5

TABLE 23—Installations in Cincinnati

Installation	Type
Carew Tower	American Carbonic
Smith-Kasson Co.	Carrier
Sinton Hotel	American Carbonic
Stouffers' Restaurant	Ice
Normandie Restaurant	Carrier
Palace Theater	Carrier
Albee Theater	Carrier
Capital Theater	Carrier
Lyric Theater	Carrier
Palms Decalcomania	Carrier
Paramount Theater	Carrier
Crosley Radio Corp.	Carrier
Gibson Tea Room & Roof	Carrier
Kroger Food Foundation	Carrier
Klosterman Restaurant	Carrier
Central Trust (vaults)	Carrier
Miller, DeBrul & Peters	Carrier
Granada Gardens	Frigidaire
St. Mary's Hospital	Frigidaire
Stratford Milinery Shop	Frigidaire
Albert Heekin Residence	Frigidaire
Mack Johnson Funeral Home	Ice
Canary Cottage Restaurant	York
Jenny Co.	Conditioned Air
B/G Sandwich Co.	Copeland
Justin Rollman Residence	Conditioned Air
Heekin Can Co. (office)	Frigidaire
United Milk Crate Corp. (office)	Frigidaire
Mrs. David May Residence	Frigidaire
Graeters' Confectionery	Frick
Cricket Restaurant	Frick
Powell Crosley, Jr., Residence	Frigidaire
Cincinnati Advertising Products Co. (office)	Frigidaire
Dr. J. N. Thiel Residence	Frigidaire
David Kahn Residence	Frigidaire
York Mfg. Co. (office)	York
C. M. Robinson Co. (office)	Frick
C. E. Meyer Funeral Home	Ice

TABLE 24—Installed in Cincinnati Before 1933

	Classified Summary	Hp.
Department Stores	4	380.5
Bank Vaults	1	50
Food & Candy Stores	4	26
Funeral Homes & Hospitals	3	8
Hotels	3	1,361.5
Industrial Concerns	9	326
Residences & Doctors' Offices	8	13
Restaurants	6	158.5
Theaters	6	1,357.5
Totals	**44**	**3,681**

TABLE 25—Installed in Cincinnati During 1933

	Classified Summary	Hp.
Department Stores	..	..
Bank Vaults	..	..
Food & Candy Stores	3	26
Funeral Homes & Hospitals	3	27
Hotel	1	17
Industrial Concerns	..	..
Residences & Doctors' Offices	8	14
Restaurants	5	82.5
Theaters	2	155
Broadcasting Station	1	1
Broker's Office	1	15
Executives' Offices	3	9
Jewelry Store	1	1
Railroad Terminal	1	125
School	1	10
Totals	**30**	**482.5**

The Union Gas & Electric Co. does not merchandise any air-conditioning equipment, but it does cooperate with the various manufacturers selling this type of equipment. Industrial and commercial prospects are handled by the Electric Sales Department and residential prospects by the Gas Department in connection with the Residence Heating Division.

BALTIMORE

By R. H. Tillman

Consolidated Gas, Electric Light & Power Co. of Baltimore

Table 26 gives data on air conditioning in Baltimore.

TABLE 26—Installations in Baltimore

Class	No. of Installations	Hp.	Estimated Annual Kwhr.	Estimated Annual Revenue
Theaters	11	1,859	902,000	$18,000
Restaurants	10	195	130,000	3,900
Bank Institutions	7	476	287,000	7,200
Salesrooms (small stores or parts of stores)	4	16	12,000	360
Industrial Equipment	9	494	365,000	9,200
Department Stores	1	165	100,000	2,000
Offices	11	45	27,000	540
Hospitals	2	23	15,000	450
Funeral Parlors	2	22	12,000	420
Library	1	327	200,000	3,000
Lecture Halls	1	45	8,000	160
Residences	7	15	7,000	170
Totals	**66**	**3,682**	**2,065,000**	**$45,400**